SEQUENCE LISTING

<110> Hudson, Thomas J.
Engert, James C.
Richter, Andrea

<120> IDENTIFICATION OF ARSACS MUTATIONS AND
METHODS OF USE THEREFOR

<130> 2825.1021-003

<140> US 09/693,205
<141> 2000-10-20

<150> US 60/160,588
<151> 1999-10-20

<160> 73

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 12793
<212> DNA
<213> Homo sapiens

<400> 1

```
atgatttaca ggaagaccat gtactcagct gcagcttcta aatccagaac gatttgcacg  60
tcttatcaag gaagtaatga atacattctg gcctggcaga gaattgattg ttcaatggta  120
tccatttgat gaaaacagaa atcacccatc tgtttcatgg cttaagatgg tttggaaaaa  180
tctttatata catttttcag aggatttgac tttatttgat gagatgccac ttatccccag  240
aactatacta gaggaaggtc agacatgtgt ggaactcatt agactcagga ttccatcgtt  300
agtcatttta gacgatgaat ctgaagcaca gcttccagaa tttttagcag acattgtaca  360
aaaacttgga gggtttgtcc ttaaaaaatt agatgcatct atacaacatc cgcttattaa  420
aaaatatatt cattcaccat taccaagtgc tgttttgcag ataatggaga agatgccatt  480
gcagaaattg tgtaatcaaa taacttcgct acttccaaca cacaaagatg ccctgaggaa  540
gttcttggct agtttaaccg atagcagtga gaaagagaaa agaattattc aagaattggc  600
aatattcaag cgcattaacc attcttctga tcagggaatt tcctcttata caaaattgaa  660
aggttgtaaa gtcttacacc atactggcaa actcccagca gatctgcgac tttctatttc  720
agtaatagac agtagtgatg aagctactat tcgtctggca aacatgttga aaatagaaca  780
gttaaagacc actagctgct taaaggttgt tttaaaagat attgaaaatg cattttattc  840
acatgaagag gtaacacagc ttatgttatg ggtccttgag aatctatctt ctcttaaaaa  900
tgagaatcca aatgtgcttg agtggttaac accattaaaa ttcatccaga tatcacagga  960
acagatggta tcagctggtg aactctttga ccctgatata gaagtactaa aggatctctt  1020
ttgtaatgaa gaaggaacct attcccacc ctcagttttt acctcaccag atattcttca  1080
ctccttaaga cagattggtt taaaaacga agccagtctc aaagaaaagg atgttgtgca  1140
agtggcaaaa aaaattgaag cctacaggt cggtgcttgt cctgatcaag atgttcttct  1200
gaagaaagcc aaaaccctct tactggtttt aaataagaat cacacactgt tgcaatcatc  1260
tgaaggaaag atgacattga agaaaataaa atgggttcca gcctgcaagg aaaggcctcc  1320
aaattatcca ggctctttgg tctggaaagg agatctctgt aatctctgtg caccaccaga  1380
tatgtgtgat gtaggccatg caattctcat tggctcctca cttcctcttg ttgaaagtat  1440
ccatgtaaac ctggaaaaag cattagggat cttcacaaaa cctagcctta gtgctgtctt  1500
aaaacacttt aaaattgttg ttgattggta ttcttcaaaa acctttagtg atgaagacta  1560
ctatcaattc cagcatattt tgcttgagat ttacggattc atgcatgatc atctaaatga  1620
agggaaagat tctttagag ccttaaaatt tccatgggtt tggactggca aaaagttttg  1680
tccacttgcc caggctgtga ttaaaccaat ccatgatctt gaccttcagc cttatttgca  1740
taatgtacct aaaaccatgg caaaattcca ccaactattt aaggtctgtg gttcaataga  1800
```

```
ggagttgaca tcagatcata tttccatggt tattcagaag atatatctca aaagtgacca 1860
agatctcagt gaacaagaaa gcaaacaaaa tcttcatctt atgttgaata ttatcagatg 1920
gctgtatagc aatcagattc cagcaagccc caacacacca gttcctatac atccatagcaa 1980
aaatccttct aaacttatca tgaagccaat tcacgaatgc tgttattgtg acattaaagt 2040
tgatgacctt aatgacttac ttgaagattc tgtggaacca atcattttgg tgcatgagga 2100
catacccatg aaaactgcag aatggctaaa agttccatgc cttagtacaa gactgataaa 2160
tcctgaaaac atgggatttg agcagtcagg acaaagagag ccacttactg taagaattaa 2220
aaatattctg gaagaatacc cttcagtgtc agatattttt aaagaactac ttcaaaacgc 2280
tgatgatgca aatgcaacag aatgcagttt cttgattgat atgagaagaa atatggacat 2340
aagagagaat ctcctagacc cagggatggc agcttgtcat ggacctgctt tgtggtcatt 2400
caacaattct caattctcag attcagattt tgtgaacata actaggttag gagaatcttt 2460
aaaaagggga gaagttgaca aagttggaaa atttggtctt ggatttaatt ctgtgtacca 2520
tatcactgac attcccatca ttatgagtcg ggaattcatg ataatgttcg atccaaacat 2580
aaatcatatc agtaaacaca ttaaagacaa atccaatcct gggatcaaaa ttaattggag 2640
taaacaacag aaaagactta gaaaatttcc taatcagttc aaaccattta tagatgtatt 2700
tggctgtcag ttacctttga ctgtagaagc accttacagc tataatggaa ccctttttccg 2760
actgtccttt agaactcaac aggaagcaaa agtgagtgaa gttagtagta cgtgctacaa 2820
tacagcagat atttattctc ttgtggatga atttagtctc tgtggacaca ggcttatcat 2880
tttcactcag agtgtaaagt caatgtattt gaagtacttg aaaattgagg aaaccaaccc 2940
cagtttagca caagatacag taataattaa aaaaaaatcc tgctcttcca aagcattgaa 3000
cacacctgtc ttaagtgttt taaaagaggc tgctaagctc atgaagactt gcagcagcag 3060
taataaaaag cttcccagtg atgaaccaaa gtcatcttgc attcttcaga tcacagtgga 3120
agaatttcac catgtgttca gaaggattgc tgattacag tcgccacttt ttagaggtcc 3180
agatgatgac ccagctgctc tctttgaaat ggctaagtct ggccaatcaa aaaagccatc 3240
agatgagttg tcacagaaaa cagtagagtg taccacgtgg cttctgtgta cttgcatgga 3300
cacaggagag gctctgaagt ttttccctgag tgagagtgga agaagactag gactggttcc 3360
atgtggggca gtaggagttc agctgtcaga aatccaggac cagaagtgga cagtgaaacc 3420
acacattgga gaggtgtttt gctatttacc tttacgaata aaaacaggct tgccagttca 3480
tatcaatggg tgctttgctg ttacatcaaa taggaaagaa atctggaaaa cagatacaaa 3540
aggacgatgg aataccacgt tcatgagaca tgttattgtg aaagcttact tacaggtact 3600
gagtgtctta cgggacctgg ccactagtgg ggagctaatg gattatactt actatgcagt 3660
atggcccgat cctgatttag ttcatgatga tttttctgta atttgccaag gatttttatga 3720
agatatagct catggaaaag ggaaagaact gaccaaagtc ttctctgatg gatctacttg 3780
ggtttccatg aagaacgtaa gatttctaga tgactctata cttaaaagaa gagatgttgg 3840
ttcagcagcc ttcaagatat tttgaaata cctcaagaag actgggtcca aaaacctttg 3900
tgctgttgaa cttccttctt cggtaaaatt aggatttgaa gaagctggct gcaaacagat 3960
actacttgaa aacacatttt cagagaaaca gtttttttct gaagtgtttt ttccaaatat 4020
tcaagaaatt gaagcagaac ttagagatcc tttaatgatc tttgttctaa atgaaaaagt 4080
tgatgagttc tcgggagttc ttcgtgttac tccatgtatt ccttgttcct tggagggcta 4140
tcctttggtt ttgccatcaa gattgatcca ccccgaagga cgagttgcaa agttatttga 4200
tattaaagat gggagattcc cttatggttc tactcaggat tatctcaatc ctattatttt 4260
gattaaacta gttcagttag gtatggcaaa agatgatatt ttatgggatg atatgctaga 4320
acgtgcagtg tcagtagctg aaattaataa aagtgatcat gttgctgcat gcctaagaag 4380
tagtatctta ttgagtctta tcgatgagaa actaaaaata agggatccta gagcaaagga 4440
ttttgctgca aaatatcaaa caatccgctt ccttccattt ctgacaaaac cagcaggttt 4500
ttctttggac tggaaaggca acagttttaa gcctgaaacc atgtttgcag caactgacct 4560
ttatacagct gaacatcaag atatagtttg tcttttgcaa ccaattctaa atgaaaattc 4620
ccattctttt agaggttgtg gttcagtgtc attggctgtt aaagagtttt tgggattact 4680
caagaagcca acagttgatc tggttataaa ccaattgaaa gaagtagcaa aatcagttga 4740
tgatggaatt acactgtacc aggagaatat caccaatgct tgctacaaat accttcatga 4800
agccttgatg caaaatgaaa tcactaagat gtcaattatt gataagttaa aacccttttag 4860
cttcattcta gttgagaatg catatgttga ctcagaaaag gtttcttttc atttaaattt 4920
tgaggcggca ccatacttt atcagttgcc taataagtat aaaaataatt tccgcgaact 4980
ttttgaaacc gtgggtgtga ggcagtcatg cactgttgaa gattttgctc ttgttttgga 5040
atctattgat caagaagag gaacaaagca aataacagaa gagaattttc agctttgccg 5100
acgaataatc agtgaaggaa tatggagtct cattagagaa aagaaacaag aattttgtga 5160
gaaaaattat ggcaagatat tattgccaga tactaatctt atgcttctcc ctgctaaatc 5220
gttatgctac aatgattgcc cttggataaa agtaaaggat accactgtaa aatattgtca 5280
tgctgacata cccagggaag tagcagtaaa actaggagca gtcccaaagc gacacaaagc 5340
```

```
cttagaaaga tatgcatcca atgtctgttt tacaacactt ggcacagaat ttgggcagaa 5400
agaaaaattg accagcagaa ttaagagcat ccttaatgca tatccttctg aaaaggaaat 5460
gttgaaagag cttcttcaaa atgctgatga tgcaaaggcg acagaaatct gttttgtgtt 5520
tgatcctaga cagcatccag ttgatagaat atttgatgat aagtgggccc cattgcaagg 5580
gccagcactt tgtgtgtaca acaaccagcc atttacagaa gatgatgtta gaggaattca 5640
gaatcttgga aaaggcacga aagagggaaa tccttataaa actggacagt atggaatagg 5700
attcaattct gtgtatcata tcacagactg cccatctttt atttctggca atgacatcct 5760
gtgtattttt gatcctcatg ccagatatgc accaggggcc acatccatta gtcccggacg 5820
catgtttaga gatttggatg cagattttag gacacagttc tcagatgttc tggatcttta 5880
tctgggaacc cattttaaac tggataattg cacaatgttc agatttcctc ttcgtaatgc 5940
agaaatggca aaagtttcgg aaatttcgtc tgttccagca tcagacagaa tggtccagaa 6000
tcttttggac aaactgcgct cagatggggc agaacttcta atgtttctta atcacatgga 6060
aaaaatttct atttgtgaaa tagataagag tactggagct ctaaatgtgc tgtattcagt 6120
aaagggcaaa atcacagatg gagacagatt gaaaaggaaa caatttcatg catctgtaat 6180
tgatagtgtt actaaaaaga ggcagctcaa agacatacca gttcaacaaa taacctatac 6240
tatggatact gaggactctg aaggaaatct tactacgtgg ctaattgta atagatcagg 6300
cttttcaagt atggagaaag tatctaaaag tgtcatatca gctcacaaga accaagatat 6360
tactctttc ccacgtggtg gagtagctgc ctgcattact cacaactata aaaaacccca 6420
tagggccttc tgttttttgc ctctttcttt ggagactggg ctgccatttc atgtgaatgg 6480
ccactttgca ctggattcag ccagaaggaa cctgtggcgt gatgataatg gagttggtgt 6540
tcgaagtgac tggaataaca gtttaatgac agcattaata gctcctgcat atgttgaatt 6600
gctaatacag ttaaaaaaac ggtatttccc tggttctgat ccaacattat cagtgttaca 6660
gaacacccct attcatgttg taaaggacac tttaaagaag ttttttatcgt ttttcccagt 6720
taaccgtctt gatctacagc cagatttata ttgtctagtg aaagcacttt acaattgcat 6780
tcacgaagac atgaaacgtc ttttacctgt tgtgcgggct ccaaatattg atggctctga 6840
cttgcactct gcagttataa ttacttggat caatatgtct acttctaata aaactagacc 6900
attttttgac aatttactac aggatgaatt acaacacctt aaaaatgcag attataatat 6960
caccacacgc aaaacagtag cagagaatgt ctataggctg aaacatctcc ttttagaaat 7020
tggtttcaac ttggtttata actgtgatga aactgctaat ctttaccact gtcttataga 7080
tgcagatatt cctgttagtt atgtgacccc tgctgatatc agatcttttt taatgacatt 7140
ttcctctcct gacactaatt gccatattgg gaagctgcct tgtcgtctgc agcagactaa 7200
tctaaaactt tttcatagtt taaaactttt agttgattat tgtttttaaag atgcagaaga 7260
aaatgagatt gaagttgagg gattgcccct tctcatcaca ctggacagtg ttttgcaaac 7320
ttttgatgca aaacgaccca agtttctaac aacatatcat gaattgattc catcccgcaa 7380
agacttgttt atgaatacat tatatttgaa atatagtaat attttattga actgtaaagt 7440
tgcaaaagtg tttgacattt ccagctttgc tgatttgtta tcctctgtgt tgcctcgaga 7500
atataagacc aaaagttgca caaagtggaa agacaatttt gcaagtgagt cttggcttaa 7560
gaatgcatgg cattttatta gtgaatctgt aagtgtgaaa gaagatcagg aagaaacaaa 7620
accaacattt gacattgttg ttgatactct aaaagactgg gcattgcttc caggaacaaa 7680
gtttactgtt tcagccaacc agcttgtggt tcctgaagga gatgttctgc ttcctctcag 7740
ccttatgcac attgcagttt ttccaaatgc ccagagtgat aaagtttttc atgctctaat 7800
gaaagccggc tgtattcagc ttgctttgaa caaaatctgt tccaaagaca gtgcatttgt 7860
tcctttgttg tcatgtcaca cagcaaatat agagagcccc acaagcatct tgaaggctct 7920
acattatatg gtccaaactt caacattag agcagaaaaa ttagtagaaa atgattttga 7980
ggcacttttg atgtatttca actgcaattt gaatcatttg atgtcccaag atgatataaa 8040
aattctaaag tcacttccgt gctataaatc catcagtggc cgctatgtaa gcattggaaa 8100
atttggaaca tgctacgtac ttacaaaaag tatcccttca gctgaagtgg agaaatggac 8160
acaatcatca tcatctgcat ttcttgaaga aaaaatacac ttaaaagaac tatatgaggt 8220
gattggttgt gtacctgtag atgatcttga ggtatatttg aaacacctct taccaaaaat 8280
tgaaaatctc tcttatgatg caaaattaga gcacttgatc taccttaaga atagattatc 8340
aagtgctgag gaattatcag agattaagga acaactttt gaaaaactgg aaagtttatt 8400
gataatccat gatgctaaca gtagactaaa gcaagcaaag catttctatg atagaactgt 8460
gagagttttt gaagttatgc ttcctgaaaa attgtttatt cctaatgatt tctttaagaa 8520
attggaacaa cttataaaac ccaaaaatca tgttacattt atgacatcct gggtggaatt 8580
cttaagaaat attggactaa aatacatact ttctcagcag cagttgttac agtttgctaa 8640
ggaaatcagt gtgagggcta atacagaaaa ctggtccaaa gaaacattgc aaaatacagt 8700
tgatatcctt ctgcatcata tattccaaga acgaatggat ttgttatctg gaaattttct 8760
gaaagaacta tctttaatac cattcttatg tcctgagcgg gcccccgcgg aattcattag 8820
atttcatcct caatatcaag aggtaaatgg aacacttcct cttataaagt tcaatggagc 8880
```

```
acaggtaaat ccaaaattca agcaatgtga tgtactccag ctgttatgga catcctgccc 8940
tattcttcca gagaaagcta caccccttaag cattaaagaa caagaaggta gtgacccttgg 9000
tccacaagaa cagcttgaac aagtttttaaa tatgcttaat gttaacctgg atcctcctct 9060
tgataaggta atcaataact gcagaaacat atgcaacata acgacgttgg atgaagaaat 9120
ggtaaaaact agagcaaaag tcttaaggag catatatgaa ttcctcagtg cagaaaaaag 9180
ggaatttcgt tttcagttgc gagggggttgc ttttgtgatg gtagaagatg gttggaaact 9240
tctgaagcct gaggaggtag tcataaacct agaatatgaa tctgatttta aaccttattt 9300
gtacaagcta cctttagaac ttggcacatt tcaccagttg ttcaaacact taggtactga 9360
agatattatt tcaactaagc aatatgttga agtgttgagc cgcatattta aaaattctga 9420
gggcaaacaa ttagatccta atgaaatgcg tacagttaag agagtagttt ctggtctgtt 9480
caggagtcta cagaatgatt cagtcaaggt gaggagtgat ctcgagaatg tacgagacct 9540
tgcgctttac ctcccaagcc aggatggtag attggtaaag tcaagcatct tagtgtttga 9600
cgatgcgcca cattataaaa gtagaatcca ggggaatatt ggtgtgcaaa tgttagttga 9660
tctcagccag tgctacttag ggaaagacca tggatttcac actaagttga taatgctctt 9720
tcctcaaaaa cttagacctc gattattgag cagtatactt gaagaacaat tagatgaaga 9780
gactcccaaa gtttgtcagt ttggagcgtt gtgttctctt caaggaagat tgcagttact 9840
cttgtcttct gaacagttca ttacaggact gattagaatt atgaagcatg aaaatgataa 9900
tgctttctg gccaatgaag aaaaagccat aagactttgc aaagccctaa gagaaggatt 9960
gaaagtatcc tgctttgaaa agcttcaaac aacattaaga gttaaaggtt ttaatcctat 10020
tccccacagc agaagtgaaa cttttgcttt tttgaagcga ttggtaatg cagtcatctt 10080
gctctacatt caacattcag acagtaaaga cattaatttc ctgttagcac tggcaatgac 10140
tcttaaatca gcaactgaca atttgatttc tgacacttca tatttaattg ctatgctagg 10200
atgcaatgat atttacagga ttggtgagaa acttgacagt ttaggagtga aatatgactc 10260
ttcggagcca tcaaaactgg aacttccaat gcctggcaca ccaattcctg ctgaaattca 10320
ttacactctg cttatggacc caatgaatgt tttttaccg ggagaatatg ttgggtacct 10380
tgttgatgct gaaggtggtg atatctatgg atcataccag ccaacataca catatgcaat 10440
tattgtacaa gaagttgaaa gagaagatgc tgacaatcct agttttctag gaaagatata 10500
tcagatagat attggttata gtgaatataa aatagttagc tctcttgatc tgtataagtt 10560
ttcaagacct gaggaaaagct ctcaaagcag ggacagtgct ccttctcac caaccagccc 10620
cactgagttc ctcacccctg gcctgagaag cattcctcct cttttctctg gtagagagag 10680
ccacaagact tcttccaaac atcagtcccc caaaaagctt aaggttaatt ctttaccaga 10740
aatcttaaaa gaagtgacat ctgtggtgga gcaagcatgg aagcttccag aatcggaacg 10800
aaaaaagatt attaggcggt tgtatttgaa atggcatcct gacaaaaatc cagagaacca 10860
tgacattgcc aatgaagttt ttaaacattt gcagaatgaa atcaacagat tagaaaaaca 10920
ggctttttcta gatcaaaatg cagacagggc ctccagacga acattttcaa cctcagcatc 10980
ccgatttcag tcagacaaat actcatttca gagattctat acttcatgga atcaagaagc 11040
aacgagccat aaatctgaaa gacagcaaca gaacaaagaa aaatgccccc cttcagccgg 11100
acagacttac tctcaaaggt tctttgttcc tcccactttc aagtcggttg gcaatccagt 11160
ggaagcacgc agatggctaa gacaagccag agcaaacttc tcagctgcca ggaatgacct 11220
tcataaaaat gccaatgagt gggtgtgctt taaatgttac ctttctacca agttagcttt 11280
gattgcagct gactatgctg tgaggggaaa gtctgataaa gatgtaaaac caactgcact 11340
tgctcagaaa atagaggaat atagtcagca acttgaagga ctgacaaatg atgttcacac 11400
attggaagct tatggtgtag acagtttaaa aacaagatac cctgatttgc ttcccttttcc 11460
tcagatccca aatgacaggt tcacttctga ggttgctatg agggtgatgg aatgtactgc 11520
ctgtatcata ataaaacttg aaaattttat gcaacaaaaa gtgtgaagat atttaacgaa 11580
aaaaaggta gatcttgaat gtgttgtagc acgaataaat tgctgtactt cattaagctt 11640
cattgccaat tagctaggaa ttgttaagca cattgcagat tgttcttgga gaattctgga 11700
gttgttatga acatgaatac caacggaaaa ccttaactga atctaaaaga aaactatttt 11760
gaagatggtg gtgagctgca aaaatagctgg atggatttga atgattggga tgatacatca 11820
ttgaactgca ctttatataa ccaaagctta gcagttgtt agataagagt ctatgtatgt 11880
ctctggttag gatgaagtta atttttatgtt tttaacatgg tattttgaa ggagctaatg 11940
aaacactgga catataattg gtttaaacat aaggggaatt aagtctttgt agtctgtcat 12000
tttttaagt ggatcctctt ggatgcgtta ttttctcatc agctggctct gatcatgaat 12060
ttgttgtaat tttatgttgt actcagtgca tttaagaaat ggtagagtat tttaatccta 12120
ttacttgact aagagtgtga aggtagtact ttttagagtg cactgagtgc actttacatc 12180
tttatttaaa ttttttttta acatcttatg tttacaggct tcctgtttga tgaagatagc 12240
aacggaaaac tcaaaatggt ggcagttctt attaccagtt gttagtattg tttctggaaa 12300
ctgcttgcca agacaacatt tattaactgt tagaacactt gctttatgtt tgtgtgtaca 12360
tattttccac aaatgttata attatatag tgtggttgaa caggatgcaa tcttttgttg 12420
```

```
tctaaaggtg ctgcagttaa aaaaaaaaca accttttctt tcaatatggc atgtagtgga 12480
gttttttaa cttaaaaac atcaaaaatt gttaaaatca ttgtgttatc tagtagtttá 12540
taattatcgg cttatatttc cccatgaatg atcagaactg acatttaatt catgtttgtc 12600
tcgccatgct tctttacttt aacatatttc ttttgcagaa tgtaaaggt aatgataatt 12660
agtttatata agtgtactgg ctgtaaatga tgctaaatat actttatgca attaagggct 12720
tacagaacat gttgaaactt tttttacttt tattgggaat aaggaatgtt tgcacctcca 12780
cattttattg ctt                                                   12793
```

<210> 2
<211> 3829
<212> PRT
<213> Homo sapiens

<400> 2

```
Met Asn Thr Phe Trp Pro Gly Arg Glu Leu Ile Val Gln Trp Tyr Pro
1               5                   10                  15
Phe Asp Glu Asn Arg Asn His Pro Ser Val Ser Trp Leu Lys Met Val
                20                  25                  30
Trp Lys Asn Leu Tyr Ile His Phe Ser Glu Asp Leu Thr Leu Phe Asp
                35                  40                  45
Glu Met Pro Leu Ile Pro Arg Thr Ile Leu Glu Glu Gly Gln Thr Cys
        50                  55                  60
Val Glu Leu Ile Arg Leu Arg Ile Pro Ser Leu Val Ile Leu Asp Asp
65                  70                  75                  80
Glu Ser Glu Ala Gln Leu Pro Glu Phe Leu Ala Asp Ile Val Gln Lys
                85                  90                  95
Leu Gly Gly Phe Val Leu Lys Lys Leu Asp Ala Ser Ile Gln His Pro
                100                 105                 110
Leu Ile Lys Lys Tyr Ile His Ser Pro Leu Pro Ser Ala Val Leu Gln
            115                 120                 125
Ile Met Glu Lys Met Pro Leu Gln Lys Leu Cys Asn Gln Ile Thr Ser
    130                 135                 140
Leu Leu Pro Thr His Lys Asp Ala Leu Arg Lys Phe Leu Ala Ser Leu
145                 150                 155                 160
Thr Asp Ser Ser Glu Lys Glu Lys Arg Ile Ile Gln Glu Leu Ala Ile
                165                 170                 175
Phe Lys Arg Ile Asn His Ser Ser Asp Gln Gly Ile Ser Ser Tyr Thr
                180                 185                 190
Lys Leu Lys Gly Cys Lys Val Leu His His Thr Ala Lys Leu Pro Ala
            195                 200                 205
Asp Leu Arg Leu Ser Ile Ser Val Ile Asp Ser Ser Asp Glu Ala Thr
    210                 215                 220
Ile Arg Leu Ala Asn Met Leu Lys Ile Glu Gln Leu Lys Thr Thr Ser
225                 230                 235                 240
Cys Leu Lys Leu Val Leu Lys Asp Ile Glu Asn Ala Phe Tyr Ser His
                245                 250                 255
Glu Glu Val Thr Gln Leu Met Leu Trp Val Leu Glu Asn Leu Ser Ser
                260                 265                 270
Leu Lys Asn Glu Asn Pro Asn Val Leu Glu Trp Leu Thr Pro Leu Lys
            275                 280                 285
Phe Ile Gln Ile Ser Gln Glu Gln Met Val Ser Ala Gly Glu Leu Phe
    290                 295                 300
Asp Pro Asp Ile Glu Val Leu Lys Asp Leu Phe Cys Asn Glu Glu Gly
305                 310                 315                 320
Thr Tyr Phe Pro Pro Ser Val Phe Thr Ser Pro Asp Ile Leu His Ser
                325                 330                 335
```

```
Leu Arg Gln Ile Gly Leu Lys Asn Glu Ala Ser Leu Lys Glu Lys Asp
        340                 345                 350
Val Val Gln Val Ala Lys Lys Ile Glu Ala Leu Gln Val Gly Ala Cys
        355                 360                 365
Pro Asp Gln Asp Val Leu Leu Lys Lys Ala Lys Thr Leu Leu Leu Val
    370                 375                 380
Leu Asn Lys Asn His Thr Leu Leu Gln Ser Ser Glu Gly Lys Met Thr
385                 390                 395                 400
Leu Lys Lys Ile Lys Trp Val Pro Ala Cys Lys Glu Arg Pro Pro Asn
            405                 410                 415
Tyr Pro Gly Ser Leu Val Trp Lys Gly Asp Leu Cys Asn Leu Cys Ala
            420                 425                 430
Pro Pro Asp Met Cys Asp Val Gly His Ala Ile Leu Ile Gly Ser Ser
        435                 440                 445
Leu Pro Leu Val Glu Ser Ile His Val Asn Leu Glu Lys Ala Leu Gly
    450                 455                 460
Ile Phe Thr Lys Pro Ser Leu Ser Ala Val Leu Lys His Phe Lys Ile
465                 470                 475                 480
Val Val Asp Trp Tyr Ser Ser Lys Thr Phe Ser Asp Glu Asp Tyr Tyr
            485                 490                 495
Gln Phe Gln His Ile Leu Leu Glu Ile Tyr Gly Phe Met His Asp His
        500                 505                 510
Leu Asn Glu Gly Lys Asp Ser Phe Arg Ala Leu Lys Phe Pro Trp Val
        515                 520                 525
Trp Thr Gly Lys Lys Phe Cys Pro Leu Ala Gln Ala Val Ile Lys Pro
    530                 535                 540
Ile His Asp Leu Asp Leu Gln Pro Tyr Leu His Asn Val Pro Lys Thr
545                 550                 555                 560
Met Ala Lys Phe His Gln Leu Phe Lys Val Cys Gly Ser Ile Glu Glu
            565                 570                 575
Leu Thr Ser Asp His Ile Ser Met Val Ile Gln Lys Ile Tyr Leu Lys
            580                 585                 590
Ser Asp Gln Asp Leu Ser Glu Gln Glu Ser Lys Gln Asn Leu His Leu
            595                 600                 605
Met Leu Asn Ile Ile Arg Trp Leu Tyr Ser Asn Gln Ile Pro Ala Ser
    610                 615                 620
Pro Asn Thr Pro Val Pro Ile His His Ser Lys Asn Pro Ser Lys Leu
625                 630                 635                 640
Ile Met Lys Pro Ile His Glu Cys Cys Tyr Cys Asp Ile Lys Val Asp
            645                 650                 655
Asp Leu Asn Asp Leu Leu Glu Asp Ser Val Glu Pro Ile Ile Leu Val
            660                 665                 670
His Glu Asp Ile Pro Met Lys Thr Ala Glu Trp Leu Lys Val Pro Cys
            675                 680                 685
Leu Ser Thr Arg Leu Ile Asn Pro Glu Asn Met Gly Phe Glu Gln Ser
    690                 695                 700
Gly Gln Arg Glu Pro Leu Thr Val Arg Ile Lys Asn Ile Leu Glu Glu
705                 710                 715                 720
Tyr Pro Ser Val Ser Asp Ile Phe Lys Glu Leu Leu Gln Asn Ala Asp
            725                 730                 735
Asp Ala Asn Ala Thr Glu Cys Ser Phe Leu Ile Asp Met Arg Arg Asn
            740                 745                 750
Met Asp Ile Arg Glu Asn Leu Leu Asp Pro Gly Met Ala Ala Cys His
        755                 760                 765
Gly Pro Ala Leu Trp Ser Phe Asn Asn Ser Gln Phe Ser Asp Ser Asp
    770                 775                 780
Phe Val Asn Ile Thr Arg Leu Gly Glu Ser Leu Lys Arg Gly Glu Val
785                 790                 795                 800
```

Asp Lys Val Gly Lys Phe Gly Leu Gly Phe Asn Ser Val Tyr His Ile
              805   810   815

Thr Asp Ile Pro Ile Ile Met Ser Arg Glu Phe Met Ile Met Phe Asp
          820   825   830

Pro Asn Ile Asn His Ile Ser Lys His Ile Lys Asp Lys Ser Asn Pro
          835   840   845

Gly Ile Lys Ile Asn Trp Ser Lys Gln Gln Lys Arg Leu Arg Lys Phe
      850   855   860

Pro Asn Gln Phe Lys Pro Phe Ile Asp Val Phe Gly Cys Gln Leu Pro
865   870   875   880

Leu Thr Val Glu Ala Pro Tyr Ser Tyr Asn Gly Thr Leu Phe Arg Leu
          885   890   895

Ser Phe Arg Thr Gln Gln Glu Ala Lys Val Ser Glu Val Ser Ser Thr
          900   905   910

Cys Tyr Asn Thr Ala Asp Ile Tyr Ser Leu Val Asp Glu Phe Ser Leu
          915   920   925

Cys Gly His Arg Leu Ile Ile Phe Thr Gln Ser Val Lys Ser Met Tyr
          930   935   940

Leu Lys Tyr Leu Lys Ile Glu Glu Thr Asn Pro Ser Leu Ala Gln Asp
945   950   955   960

Thr Val Ile Ile Lys Lys Lys Ser Cys Ser Ser Lys Ala Leu Asn Thr
          965   970   975

Pro Val Leu Ser Val Leu Lys Glu Ala Ala Lys Leu Met Lys Thr Cys
          980   985   990

Ser Ser Ser Asn Lys Lys Leu Pro Ser Asp Glu Pro Lys Ser Ser Cys
          995   1000   1005

Ile Leu Gln Ile Thr Val Glu Glu Phe His His Val Phe Arg Arg Ile
      1010   1015   1020

Ala Asp Leu Gln Ser Pro Leu Phe Arg Gly Pro Asp Asp Asp Pro Ala
1025   1030   1035   1040

Ala Leu Phe Glu Met Ala Lys Ser Gly Gln Ser Lys Lys Pro Ser Asp
          1045   1050   1055

Glu Leu Ser Gln Lys Thr Val Glu Cys Thr Thr Trp Leu Leu Cys Thr
          1060   1065   1070

Cys Met Asp Thr Gly Glu Ala Leu Lys Phe Ser Leu Ser Glu Ser Gly
          1075   1080   1085

Arg Arg Leu Gly Leu Val Pro Cys Gly Ala Val Gly Val Gln Leu Ser
      1090   1095   1100

Glu Ile Gln Asp Gln Lys Trp Thr Val Lys Pro His Ile Gly Glu Val
1105   1110   1115   1120

Phe Cys Tyr Leu Pro Leu Arg Ile Lys Thr Gly Leu Pro Val His Ile
          1125   1130   1135

Asn Gly Cys Phe Ala Val Thr Ser Asn Arg Lys Glu Ile Trp Lys Thr
          1140   1145   1150

Asp Thr Lys Gly Arg Trp Asn Thr Thr Phe Met Arg His Val Ile Val
          1155   1160   1165

Lys Ala Tyr Leu Gln Val Leu Ser Val Leu Arg Asp Leu Ala Thr Ser
      1170   1175   1180

Gly Glu Leu Met Asp Tyr Thr Tyr Tyr Ala Val Trp Pro Asp Pro Asp
1185   1190   1195   1200

Leu Val His Asp Asp Phe Ser Val Ile Cys Gln Gly Phe Tyr Glu Asp
          1205   1210   1215

Ile Ala His Gly Lys Gly Lys Glu Leu Thr Lys Val Phe Ser Asp Gly
          1220   1225   1230

Ser Thr Trp Val Ser Met Lys Asn Val Arg Phe Leu Asp Asp Ser Ile
          1235   1240   1245

Leu Lys Arg Arg Asp Val Gly Ser Ala Ala Phe Lys Ile Phe Leu Lys
      1250   1255   1260

```
Tyr Leu Lys Lys Thr Gly Ser Lys Asn Leu Cys Ala Val Glu Leu Pro
1265             1270             1275                 1280
Ser Ser Val Lys Leu Gly Phe Glu Glu Ala Gly Cys Lys Gln Ile Leu
            1285             1290             1295
Leu Glu Asn Thr Phe Ser Glu Lys Gln Phe Phe Ser Glu Val Phe Phe
            1300             1305             1310
Pro Asn Ile Gln Glu Ile Glu Ala Glu Leu Arg Asp Pro Leu Met Ile
            1315             1320         1325
Phe Val Leu Asn Glu Lys Val Asp Glu Phe Ser Gly Val Leu Arg Val
            1330             1335         1340
Thr Pro Cys Ile Pro Cys Ser Leu Glu Gly His Pro Leu Val Leu Pro
1345             1350             1355                 1360
Ser Arg Leu Ile His Pro Glu Gly Arg Val Ala Lys Leu Phe Asp Ile
            1365             1370         1375
Lys Asp Gly Arg Phe Pro Tyr Gly Ser Thr Gln Asp Tyr Leu Asn Pro
            1380             1385             1390
Ile Ile Leu Ile Lys Leu Val Gln Leu Gly Lys Ala Lys Asp Asp Ile
            1395             1400             1405
Leu Trp Asp Asp Met Leu Glu Arg Ala Val Ser Val Ala Glu Ile Asn
            1410             1415             1420
Lys Ser Asp His Val Ala Ala Cys Leu Arg Ser Ser Ile Leu Leu Ser
1425             1430             1435                 1440
Leu Ile Asp Glu Lys Leu Lys Ile Arg Asp Pro Arg Ala Lys Asp Phe
            1445             1450             1455
Ala Ala Lys Tyr Gln Thr Ile Arg Phe Leu Pro Phe Leu Thr Lys Pro
            1460             1465             1470
Ala Gly Phe Ser Leu Asp Trp Lys Gly Asn Ser Phe Lys Pro Glu Thr
            1475             1480             1485
Met Phe Ala Ala Thr Asp Leu Tyr Thr Ala Glu His Gln Asp Ile Val
            1490             1495             1500
Cys Leu Leu Gln Pro Ile Leu Asn Glu Asn Ser His Ser Phe Arg Gly
1505             1510             1515                 1520
Cys Gly Ser Val Ser Leu Ala Val Lys Glu Phe Leu Gly Leu Leu Lys
            1525             1530             1535
Lys Pro Thr Val Asp Leu Val Ile Asn Gln Leu Lys Glu Val Ala Lys
            1540             1545             1550
Ser Val Asp Asp Gly Ile Thr Leu Tyr Gln Glu Asn Ile Thr Asn Ala
            1555             1560             1565
Cys Tyr Lys Tyr Leu His Glu Ala Leu Met Gln Asn Glu Ile Thr Lys
            1570             1575             1580
Met Ser Ile Ile Asp Lys Leu Lys Pro Phe Ser Phe Ile Leu Val Glu
1585             1590             1595                 1600
Asn Ala Tyr Val Asp Ser Glu Lys Val Ser Phe His Leu Asn Phe Glu
            1605             1610             1615
Ala Ala Pro Tyr Leu Tyr Gln Leu Pro Asn Lys Tyr Lys Asn Asn Phe
            1620             1625             1630
Arg Glu Leu Phe Glu Thr Val Gly Val Arg Gln Ser Cys Thr Val Glu
            1635             1640             1645
Asp Phe Ala Leu Val Leu Glu Ser Ile Asp Gln Glu Arg Gly Thr Lys
            1650             1655             1660
Gln Ile Thr Glu Glu Asn Phe Gln Leu Cys Arg Arg Ile Ile Ser Glu
1665             1670             1675                 1680
Gly Ile Trp Ser Leu Ile Arg Glu Lys Lys Gln Glu Phe Cys Glu Lys
            1685             1690             1695
Asn Tyr Gly Lys Ile Leu Leu Pro Asp Thr Asn Leu Met Leu Leu Pro
            1700             1705             1710
Ala Lys Ser Leu Cys Tyr Asn Asp Cys Pro Trp Ile Lys Val Lys Asp
            1715             1720             1725
```

```
Thr Thr Val Lys Tyr Cys His Ala Asp Ile Pro Arg Glu Val Ala Val
    1730                1735                1740
Lys Leu Gly Ala Val Pro Lys Arg His Lys Ala Leu Glu Arg Tyr Ala
1745                1750                1755                1760
Ser Asn Val Cys Phe Thr Thr Leu Gly Thr Glu Phe Gly Gln Lys Glu
                1765                1770                1775
Lys Leu Thr Ser Arg Ile Lys Ser Ile Leu Asn Ala Tyr Pro Ser Glu
            1780                1785                1790
Lys Glu Met Leu Lys Glu Leu Leu Gln Asn Ala Asp Asp Ala Lys Ala
            1795                1800                1805
Thr Glu Ile Cys Phe Val Phe Asp Pro Arg Gln His Pro Val Asp Arg
            1810                1815                1820
Ile Phe Asp Asp Lys Trp Ala Pro Leu Gln Gly Pro Ala Leu Cys Val
·1825                1830                1835                1840
Tyr Asn Asn Gln Pro Phe Thr Glu Asp Asp Val Arg Gly Ile Gln Asn
                1845                1850                1855
Leu Gly Lys Gly Thr Lys Glu Gly Asn Pro Tyr Lys Thr Gly Gln Tyr
            1860                1865                1870
Gly Ile Gly Phe Asn Ser Val Tyr His Ile Thr Asp Cys Pro Ser Phe
            1875                1880                1885
Ile Ser Gly Asn Asp Ile Leu Cys Ile Phe Asp Pro His Ala Arg Tyr
            1890                1895                1900
Ala Pro Gly Ala Thr Ser Ile Ser Pro Gly Arg Met Phe Arg Asp Leu
1905                1910                1915                1920
Asp Ala Asp Phe Arg Thr Gln Phe Ser Asp Val Leu Asp Leu Tyr Leu
                1925                1930                1935
Gly Thr His Phe Lys Leu Asp Asn Cys Thr Met Phe Arg Phe Pro Leu
            1940                1945                1950
Arg Asn Ala Glu Met Ala Lys Val Ser Glu Ile Ser Ser Val Pro Ala
            1955                1960                1965
Ser Asp Arg Met Val Gln Asn Leu Leu Asp Lys Leu Arg Ser Asp Gly
            1970                1975                1980
Ala Glu Leu Leu Met Phe Leu Asn His Met Glu Lys Ile Ser Ile Cys
1985                1990                1995                2000
Glu Ile Asp Lys Ser Thr Gly Ala Leu Asn Val Leu Tyr Ser Val Lys
                2005                2010                2015
Gly Lys Ile Thr Asp Gly Asp Arg Leu Lys Arg Lys Gln Phe His Ala
            2020                2025                2030
Ser Val Ile Asp Ser Val Thr Lys Lys Arg Gln Leu Lys Asp Ile Pro
            2035                2040                2045
Val Gln Gln Ile Thr Tyr Thr Met Asp Thr Glu Asp Ser Glu Gly Asn
    2050                2055                2060
Leu Thr Thr Trp Leu Ile Cys Asn Arg Ser Gly Phe Ser Ser Met Glu
2065                2070                2075                2080
Lys Val Ser Lys Ser Val Ile Ser Ala His Lys Asn Gln Asp Ile Thr
            2085                2090                2095
Leu Phe Pro Arg Gly Gly Val Ala Ala Cys Ile Thr His Asn Tyr Lys
            2100                2105                2110
Lys Pro His Arg Ala Phe Cys Phe Leu Pro Leu Ser Leu Glu Thr Gly
            2115                2120                2125
Leu Pro Phe His Val Asn Gly His Phe Ala Leu Asp Ser Ala Arg Arg
    2130                2135                2140
Asn Leu Trp Arg Asp Asp Asn Gly Val Gly Val Arg Ser Asp Trp Asn
2145                2150                2155                2160
Asn Ser Leu Met Thr Ala Leu Ile Ala Pro Ala Tyr Val Glu Leu Leu
            2165                2170                2175
Ile Gln Leu Lys Lys Arg Tyr Phe Pro Gly Ser Asp Pro Thr Leu Ser
            2180                2185                2190
```

```
Val Leu Gln Asn Thr Pro Ile His Val Val Lys Asp Thr Leu Lys Lys
        2195                2200                2205
Phe Leu Ser Phe Phe Pro Val Asn Arg Leu Asp Leu Gln Pro Asp Leu
        2210                2215                2220
Tyr Cys Leu Val Lys Ala Leu Tyr Asn Cys Ile His Glu Asp Met Lys
2225                2230                2235                2240
Arg Leu Leu Pro Val Val Arg Ala Pro Asn Ile Asp Gly Ser Asp Leu
            2245                2250                2255
His Ser Ala Val Ile Ile Thr Trp Ile Asn Met Ser Thr Ser Asn Lys
            2260                2265                2270
Thr Arg Pro Phe Phe Asp Asn Leu Leu Gln Asp Glu Leu Gln His Leu
            2275                2280                2285
Lys Asn Ala Asp Tyr Asn Ile Thr Thr Arg Lys Thr Val Ala Glu Asn
        2290                2295                2300
Val Tyr Arg Leu Lys His Leu Leu Leu Glu Ile Gly Phe Asn Leu Val
2305                2310                2315                2320
Tyr Asn Cys Asp Glu Thr Ala Asn Leu Tyr His Cys Leu Ile Asp Ala
            2325                2330                2335
Asp Ile Pro Val Ser Tyr Val Thr Pro Ala Asp Ile Arg Ser Phe Leu
            2340                2345                2350
Met Thr Phe Ser Ser Pro Asp Thr Asn Cys His Ile Gly Lys Leu Pro
            2355                2360                2365
Cys Arg Leu Gln Gln Thr Asn Leu Lys Leu Phe His Ser Leu Lys Leu
        2370                2375                2380
Leu Val Asp Tyr Cys Phe Lys Asp Ala Glu Glu Asn Glu Ile Glu Val
2385                2390                2395                2400
Glu Gly Leu Pro Leu Leu Ile Thr Leu Asp Ser Val Leu Gln Thr Phe
            2405                2410                2415
Asp Ala Lys Arg Pro Lys Phe Leu Thr Thr Tyr His Glu Leu Ile Pro
        2420                2425                2430
Ser Arg Lys Asp Leu Phe Met Asn Thr Leu Tyr Leu Lys Tyr Ser Asn
        2435                2440                2445
Ile Leu Leu Asn Cys Lys Val Ala Lys Val Phe Asp Ile Ser Ser Phe
    2450                2455                2460
Ala Asp Leu Leu Ser Ser Val Leu Pro Arg Glu Tyr Lys Thr Lys Ser
2465                2470                2475                2480
Cys Thr Lys Trp Lys Asp Asn Phe Ala Ser Glu Ser Trp Leu Lys Asn
            2485                2490                2495
Ala Trp His Phe Ile Ser Glu Ser Val Ser Val Lys Glu Asp Gln Glu
        2500                2505                2510
Glu Thr Lys Pro Thr Phe Asp Ile Val Val Asp Thr Leu Lys Asp Trp
        2515                2520                2525
Ala Leu Leu Pro Gly Thr Lys Phe Thr Val Ser Ala Asn Gln Leu Val
        2530                2535                2540
Val Pro Glu Gly Asp Val Leu Leu Pro Leu Ser Leu Met His Ile Ala
2545                2550                2555                2560
Val Phe Pro Asn Ala Gln Ser Asp Lys Val Phe His Ala Leu Met Lys
            2565                2570                2575
Ala Gly Cys Ile Gln Leu Ala Leu Asn Lys Ile Cys Ser Lys Asp Ser
            2580                2585                2590
Ala Phe Val Pro Leu Leu Ser Cys His Thr Ala Asn Ile Glu Ser Pro
            2595                2600                2605
Thr Ser Ile Leu Lys Ala Leu His Tyr Met Val Gln Thr Ser Thr Phe
        2610                2615                2620
Arg Ala Glu Lys Leu Val Glu Asn Asp Phe Glu Ala Leu Leu Met Tyr
2625                2630                2635                2640
Phe Asn Cys Asn Leu Asn His Leu Met Ser Gln Asp Asp Ile Lys Ile
            2645                2650                2655
```

```
Leu Lys Ser Leu Pro Cys Tyr Lys Ser Ile Ser Gly Arg Tyr Val Ser
        2660                2665              2670
Ile Gly Lys Phe Gly Thr Cys Tyr Val Leu Thr Lys Ser Ile Pro Ser
        2675                2680              2685
Ala Glu Val Glu Lys Trp Thr Gln Ser Ser Ser Ser Ala Phe Leu Glu
    2690                2695              2700
Glu Lys Ile His Leu Lys Glu Leu Tyr Glu Val Ile Gly Cys Val Pro
2705                2710              2715              2720
Val Asp Asp Leu Glu Val Tyr Leu Lys His Leu Leu Pro Lys Ile Glu
            2725                2730              2735
Asn Leu Ser Tyr Asp Ala Lys Leu Glu His Leu Ile Tyr Leu Lys Asn
        2740                2745              2750
Arg Leu Ser Ser Ala Glu Glu Leu Ser Glu Ile Lys Glu Gln Leu Phe
        2755                2760              2765
Glu Lys Leu Glu Ser Leu Leu Ile Ile His Asp Ala Asn Ser Arg Leu
        2770                2775              2780
Lys Gln Ala Lys His Phe Tyr Asp Arg Thr Val Arg Val Phe Glu Val
2785                2790              2795              2800
Met Leu Pro Glu Lys Leu Phe Ile Pro Asn Asp Phe Phe Lys Lys Leu
            2805                2810              2815
Glu Gln Leu Ile Lys Pro Lys Asn His Val Thr Phe Met Thr Ser Trp
        2820                2825              2830
Val Glu Phe Leu Arg Asn Ile Gly Leu Lys Tyr Ile Leu Ser Gln Gln
        2835                2840              2845
Gln Leu Leu Gln Phe Ala Lys Glu Ile Ser Val Arg Ala Asn Thr Glu
    2850                2855              2860
Asn Trp Ser Lys Glu Thr Leu Gln Asn Thr Val Asp Ile Leu Leu His
2865                2870              2875              2880
His Ile Phe Gln Glu Arg Met Asp Leu Leu Ser Gly Asn Phe Leu Lys
            2885                2890              2895
Glu Leu Ser Leu Ile Pro Phe Leu Cys Pro Glu Arg Ala Pro Ala Glu
        2900                2905              2910
Phe Ile Arg Phe His Pro Gln Tyr Gln Glu Val Asn Gly Thr Leu Pro
        2915                2920              2925
Leu Ile Lys Phe Asn Gly Ala Gln Val Asn Pro Lys Phe Lys Gln Cys
        2930                2935              2940
Asp Val Leu Gln Leu Leu Trp Thr Ser Cys Pro Ile Leu Pro Glu Lys
2945                2950              2955              2960
Ala Thr Pro Leu Ser Ile Lys Glu Gln Glu Gly Ser Asp Leu Gly Pro
        2965                2970              2975
Gln Glu Gln Leu Glu Gln Val Leu Asn Met Leu Asn Val Asn Leu Asp
        2980                2985              2990
Pro Pro Leu Asp Lys Val Ile Asn Asn Cys Arg Asn Ile Cys Asn Ile
        2995                3000              3005
Thr Thr Leu Asp Glu Glu Met Val Lys Thr Arg Ala Lys Val Leu Arg
    3010                3015              3020
Ser Ile Tyr Glu Phe Leu Ser Ala Glu Lys Arg Glu Phe Arg Phe Gln
3025                3030              3035              3040
Leu Arg Gly Val Ala Phe Val Met Val Glu Asp Gly Trp Lys Leu Leu
            3045                3050              3055
Lys Pro Glu Glu Val Val Ile Asn Leu Glu Tyr Glu Ser Asp Phe Lys
        3060                3065              3070
Pro Tyr Leu Tyr Lys Leu Pro Leu Glu Leu Gly Thr Phe His Gln Leu
        3075                3080              3085
Phe Lys His Leu Gly Thr Glu Asp Ile Ile Ser Thr Lys Gln Tyr Val
    3090                3095              3100
Glu Val Leu Ser Arg Ile Phe Lys Asn Ser Glu Gly Lys Gln Leu Asp
3105                3110              3115              3120
```

```
Pro Asn Glu Met Arg Thr Val Lys Arg Val Val Ser Gly Leu Phe Arg
              3125                3130                3135
Ser Leu Gln Asn Asp Ser Val Lys Val Arg Ser Asp Leu Glu Asn Val
              3140                3145                3150
Arg Asp Leu Ala Leu Tyr Leu Pro Ser Gln Asp Gly Arg Leu Val Lys
              3155                3160                3165
Ser Ser Ile Leu Val Phe Asp Asp Ala Pro His Tyr Lys Ser Arg Ile
         3170                3175                3180
Gln Gly Asn Ile Gly Val Gln Met Leu Val Asp Leu Ser Gln Cys Tyr
3185                3190                3195                3200
Leu Gly Lys Asp His Gly Phe His Thr Lys Leu Ile Met Leu Phe Pro
              3205                3210                3215
Gln Lys Leu Arg Pro Arg Leu Leu Ser Ser Ile Leu Glu Glu Gln Leu
              3220                3225                3230
Asp Glu Glu Thr Pro Lys Val Cys Gln Phe Gly Ala Leu Cys Ser Leu
              3235                3240                3245
Gln Gly Arg Leu Gln Leu Leu Leu Ser Ser Glu Gln Phe Ile Thr Gly
         3250                3255                3260
Leu Ile Arg Ile Met Lys His Glu Asn Asp Asn Ala Phe Leu Ala Asn
3265                3270                3275                3280
Glu Glu Lys Ala Ile Arg Leu Cys Lys Ala Leu Arg Glu Gly Leu Lys
              3285                3290                3295
Val Ser Cys Phe Glu Lys Leu Gln Thr Thr Leu Arg Val Lys Gly Phe
              3300                3305                3310
Asn Pro Ile Pro His Ser Arg Ser Glu Thr Phe Ala Phe Leu Lys Arg
              3315                3320                3325
Phe Gly Asn Ala Val Ile Leu Leu Tyr Ile Gln His Ser Asp Ser Lys
              3330                3335                3340
Asp Ile Asn Phe Leu Leu Ala Leu Ala Met Thr Leu Lys Ser Ala Thr
3345                3350                3355                3360
Asp Asn Leu Ile Ser Asp Thr Ser Tyr Leu Ile Ala Met Leu Gly Cys
              3365                3370                3375
Asn Asp Ile Tyr Arg Ile Gly Glu Lys Leu Asp Ser Leu Gly Val Lys
              3380                3385                3390
Tyr Asp Ser Ser Glu Pro Ser Lys Leu Glu Leu Pro Met Pro Gly Thr
              3395                3400                3405
Pro Ile Pro Ala Glu Ile His Tyr Thr Leu Leu Met Asp Pro Met Asn
         3410                3415                3420
Val Phe Tyr Pro Gly Glu Tyr Val Gly Tyr Leu Val Asp Ala Glu Gly
3425                3430                3435                3440
Gly Asp Ile Tyr Gly Ser Tyr Gln Pro Thr Tyr Thr Tyr Ala Ile Ile
              3445                3450                3455
Val Gln Glu Val Glu Arg Glu Asp Ala Asp Asn Ser Ser Phe Leu Gly
              3460                3465                3470
Lys Ile Tyr Gln Ile Asp Ile Gly Tyr Ser Glu Tyr Lys Ile Val Ser
         3475                3480                3485
Ser Leu Asp Leu Tyr Lys Phe Ser Arg Pro Glu Glu Ser Ser Gln Ser
         3490                3495                3500
Arg Asp Ser Ala Pro Ser Thr Pro Thr Ser Pro Thr Glu Phe Leu Thr
3505                3510                3515                3520
Pro Gly Leu Arg Ser Ile Pro Pro Leu Phe Ser Gly Arg Glu Ser His
              3525                3530                3535
Lys Thr Ser Ser Lys His Gln Ser Pro Lys Lys Leu Lys Val Asn Ser
              3540                3545                3550
Leu Pro Glu Ile Leu Lys Glu Val Thr Ser Val Val Glu Gln Ala Trp
         3555                3560                3565
Lys Leu Pro Glu Ser Glu Arg Lys Lys Ile Ile Arg Arg Leu Tyr Leu
         3570                3575                3580
```

```
Lys Trp His Pro Asp Lys Asn Pro Glu Asn His Asp Ile Ala Asn Glu
3585            3590            3595            3600
Val Phe Lys His Leu Gln Asn Glu Ile Asn Arg Leu Glu Lys Gln Ala
            3605            3610            3615
Phe Leu Asp Gln Asn Ala Asp Arg Ala Ser Arg Arg Thr Phe Ser Thr
            3620            3625            3630
Ser Ala Ser Arg Phe Gln Ser Asp Lys Tyr Ser Phe Gln Arg Phe Tyr
            3635            3640            3645
Thr Ser Trp Asn Gln Glu Ala Thr Ser His Lys Ser Glu Arg Gln Gln
            3650            3655            3660
Gln Asn Lys Glu Lys Cys Pro Pro Ser Ala Gly Gln Thr Tyr Ser Gln
3665            3670            3675            3680
Arg Phe Phe Val Pro Pro Thr Phe Lys Ser Val Gly Asn Pro Val Glu
            3685            3690            3695
Ala Arg Arg Trp Leu Arg Gln Ala Arg Ala Asn Phe Ser Ala Ala Arg
            3700            3705            3710
Asn Asp Leu His Lys Asn Ala Asn Glu Trp Val Cys Phe Lys Cys Tyr
            3715            3720            3725
Leu Ser Thr Lys Leu Ala Leu Ile Ala Ala Asp Tyr Ala Val Arg Gly
            3730            3735            3740
Lys Ser Asp Lys Asp Val Lys Pro Thr Ala Leu Ala Gln Lys Ile Glu
3745            3750            3755            3760
Glu Tyr Ser Gln Gln Leu Glu Gly Leu Thr Asn Asp Val His Thr Leu
            3765            3770            3775
Glu Ala Tyr Gly Val Asp Ser Leu Lys Thr Arg Tyr Pro Asp Leu Leu
            3780            3785            3790
Pro Phe Pro Gln Ile Pro Asn Asp Arg Phe Thr Ser Glu Val Ala Met
            3795            3800            3805
Arg Val Met Glu Cys Thr Ala Cys Ile Ile Ile Lys Leu Glu Asn Phe
3810            3815            3820
Met Gln Gln Lys Val
3825
```

```
<210> 3
<211> 11492
<212> DNA
<213> Mus musculus

<400> 3
atgaatacat tctggcctgg tcgagagttg gtggttcagt ggtatccatt tagtgaagac 60
aaacgtcacc catcccttc atggcttaag atggtttgga agaatctcta tatacatttc 120
tcggaagatt tgactttatt tgatgagatg ccacttatcc ctagaactct actgaatgag 180
gaccagacgt gtgtggaact catcagactc aggatcccat cagtagtcat tttagatgat 240
gaaactgaag ctcagcttcc agaattctta gcagatattg tacaaaaact tggagggatt 300
gtcctgaaaa gactagatac ctctattcag catccacttg ttaaaaaata cattcattcc 360
ccactcccga gtgctatttt gcagataatg gagaagatac tctacagaa gttgtgtaat 420
aaatagcatc attacttcca acccacaaag atgctctaag gaagtttttg gccagcttaa 480
ctgataccag tgaaaaagag aaaagaataa ttcaagaatt gacaatattc aaaagaatta 540
atcactcatc agatcaaggg atttcctctt acacaaaatt aaaaggatgt aaagtttgg 600
atcataccgc caagcttcca acagatctac ggctatcagt ttcagtaata gatagtagtg 660
atgaagccac cattcgtttg gcaaacatgt tgaaaattga aaaattgaag actacaagct 720
gtttaaagtt tgttttaaaa gatattggaa atgcatttta tacacaggaa gaggtaacac 780
aacttatgct ttggatcctt gagaatctat cctctcttaa aaatgagaat tcaaatgtgc 840
ttgattggtt aatggcacta aaattcattc atatgtccca gggacatgtg gtagcagctg 900
gtgatctctt tgatcctgat atagaagtac taagggatct cttttataat gaagaagaag 960
cttgtttccc acctacaatt tttacctcac cagatatcct tcactctttg agacagattg 1020
gcttaaaaaa tgaatccagt ctaaaagaaa aagatgttgt acaagtggca agaaaaattg 1080
```

```
aagctttaca ggtcagttcc tgtcagaatc aggatgttct catgaagaaa gccaaaacac 1140
tcttactggt cttgaataaa aaccagacac tcttgcagtc ttctgaaggg aagatggcat 1200
tgaagaaaat caaatgggtt ccagcctgca aggaaagacc tccaaattat cccggttcct 1260
tagtctggaa aggggatctc tgtaatcttt gtgcacctcc agatatgtgt gatgcggcac 1320
atgcagttct agtaggctcc tcacttcctc ttgttgaaag tgtccatgtg aacctggagc 1380
aggcgctcag catcttcaca aagcctacta tcaatgctgt cttaaaacac tttaaaactg 1440
ttgttgactg gtatacttca aaaaccttta gtgatgaaga ttactatcag ttccaacata 1500
ttttgcttga aatttatggg ttcatgcatg atcatctgag tgaagggaag gattctttta 1560
aagccttgaa gtttccatgg gtttggactg gcaaaaactt ttgtcctctt gcccaggctg 1620
tgataaagcc aacccatgat ctggatcttc agccttattt atataatgtg cctaaaacca 1680
tggcaaaatt ccaccagctg ttcaaggctt gtggctcaat agaagagttg acatcagatc 1740
atatttccat ggtcattcag aaagtttatc tcaaaagtga ccaggagttg agtgaagaag 1800
aaagtaaaca aaatcttcat ctcatgttga atattatgag atggctctat agcaatcaga 1860
ttccagcaag ccctaataca ccagttccta tttatcacag cagaaatcct tccaaacttg 1920
tcatgaagcc aattcatgaa tgctgttatt gtgacatcaa agttgatgac ctcaatgact 1980
tgcttgaaga ttcagtggaa ccaattatct tggtacatga agatataccc atgaaaactg 2040
cagaatggct aaaaagttccg tgccttagta caagactgat caatcctgaa aacatggggt 2100
ttgagcagtc agggcaaaga gagcctctta ctgtaaggat taaaaatatt ttggaagaat 2160
acccttccgt gtcagatatt tttaaagagc tacttcaaaa tgctgatgat gcaaatgcca 2220
cagaatgcag cttcatgatt gatatgagaa ggaatatgga catacgggaa aatctcctgg 2280
acccagggat ggcagcttgt catggacctg ctctgtggtc attcaacaat tctgaattct 2340
cagattcaga tttcttaaac ataacgaggt taggagagtc tttaaaaagg ggagaagttg 2400
acaaggttgg gaaatttggt cttggttttta attctgtgta ccacatcact gacattccca 2460
tcattatgag cagagaattt atgataatgt ttgatccaaa cataaatcat atcagcaaac 2520
acattaaaga tagatcgaat cctggaatca aaattaattg gagtaagcag cagaaaagac 2580
ttaggaagtt cccccaaccag ttcaaaccat ttatagatgt atttggctgt cagttacctt 2640
tggctgttga agctccttac agctacaatg gaactctttt ccgactgtcc tttagaacac 2700
agcaggaagc aaaagtgagt gaagttagca gtacttgcta caatactgcg gatatttact 2760
ccctagtgga tgaatttagt cttttgtgggc acagattat cattttttact cagagtgtaa 2820
actcgatgta tttgaaatac ttgaaaattg aagaaccaa tcctagctta gcacaagata 2880
caatcataat taagaaaaaa gtttgcccct ccaagcatt gaatgcacca gttttaagtg 2940
ttttaaaaga agctgctaaa ctcatgaaga cttgtagcag cagcaacaag aagcttccca 3000
cggatgtgcc aaagtcatct tgcattcttc agatcacagt cgaagaattc caccatgtgt 3060
ttaggaggat tgctgactta cagtcaccac tatttcgagg tccagatgat gacccagcta 3120
ctctctttga aatggctaaa tctggccaat caaaaaagcc atcagatgag ttgccacaaa 3180
agacagtaga ttgtaccaca tggcttatat gcacatgcat ggatacagga gaagctctca 3240
agttttcctt gaatgaaagt ggaagaagat tagggctggt tccttgtggg gcagtagggg 3300
ttctcttgca tgaaacccag gaacagaagt ggaccgtgaa accacacata ggagaagtgt 3360
tttgctattt acctctacga atcaaaacag ggttgccaat tcacatcaat gggtgctttg 3420
ctgttacttc aaataggaaa gaaatctgga agacagatac aaaaggtcga tggaatacca 3480
cattcatgag gcatgtcatt gtgaaagctt acttacaagc cctcagtgtc ttacgggacc 3540
tagccattgg tggtgagctg actgattata cttactatgc agtgtggcct gatcctgatc 3600
tagttcatga tgacttctct gtgatctgta aaggatttta tgaagacatt gctcatggga 3660
aggggaagga gttgaccaga gtcttctctg atgggtctat gtgggtttcc atgaagaatg 3720
tgaggtttct ggatgactct atacttcaaa ggaaagatgt tggttcagca gccttcaaga 3780
tatttctgaa gtacctcaag aaaacaggat ccaaaaacct ctgtgctgtt gagcttcctt 3840
cttcagtaaa agcaggattt gaagaggctg gctgtaaaca gatactgctg gaaaatacat 3900
tttcagagaa acagttcttt tcagaagtct tcttcctaa tatccaggaa attgaagcag 3960
aacttagaga tcctctgatg aattttgtcc taaatgaaaa acttgatgag ttctcaggaa 4020
ttcttcgtgt tacccccttgt gttccttgct ccttggaggg ccatcctttg gttttgcctt 4080
caagattgat ccatcctgaa ggacgagttg caaagttatt tgatactaaa gatggaagat 4140
tcccttatgg ttccacacag gattacctca atcctattat cttgattaag ctcgttcagt 4200
taggcatggc aaaagatgat atttgtgggg atgacatgct agagcgtgca gagtctgtag 4260
ctgagattaa taaaagtgac catgctgctg cctgcttaag gagtagtatt ctgctaagcc 4320
ttattgatga gaagctaaaa ataaggatc ctagagcaaa ggattttgct gcaaaatatc 4380
aaacaattcc cttcctccca tttctaacaa agccagcagg tttttctttta gaatggaaag 4440
ggaacagctt taagcctgaa accatgtttg cagcaactga catttacaca gctgaatatc 4500
aagatatagt ctgtctttg caaccaattc ttaatgaaaa ttcccattcc tttagaggct 4560
```

```
gtggttcagt gtctttggct gttaaggagt ttttgggttt actaaagaag ccaacagttg 4620
atctggtaat aaaccagttg aagcaagttg caaaatcagt tgatgatggc attacattgt 4680
accaggaaaa tatcaccaac gcttgctaca aatacctcca tgaagcagta ttgcagaatg 4740
aaatggccaa ggcaacaatt attgagaagc taaagccatt ttgtttcatt ctagttgaga 4800
atgtatatgt tgagtcagaa aaggtttctt ttcacttgaa cttttgaagca gcaccatacc 4860
tttatcagtt acctaacaag tataaaaata atttccgtga gcttttgaa agtgtgggtg 4920
tgcgacagtc atttactgtt gaagactttg ccctagtttt ggagtctatt gatcaagaga 4980
gaggaaaaaa acaaataaca gaagagaatt ttcagctttg ccgacgaata atcagtgaag 5040
gcatctggag tctcattaga gaaaagagac aagaattttg tgagaaaaat tatggcaaaa 5100
tattactgcc agacactaac ctgctgctgc tccctgctaa gtcattatgc tacaatgact 5160
gtccctggat aaaagtaaag gactccactg tcaagtattg ccatgccgac ataccccggg 5220
aagtagctgt aaaacttggt gcaataccaa agagacataa agcattagaa agatatgcat 5280
ccaacatctg tttcacagct ctaggtacag aatttgggca gaaagaaaaa ctgaccagca 5340
gaattaagag cattctcaat gcctatcctt cagaaaagga aatgctgaaa gagcttcttc 5400
aaaatgctga tgatgcaaag gccacagaga tctgctttgt gtttgatcct agacagcatc 5460
ctgttgaccg aatatttgat gataagtggg ccccactgca agggccagca ctgtgtgttt 5520
acaacaacca gccatttaca gaagatgatg ttagaggaat tcagaatctt gggaaaggca 5580
ccaaagaagg gaatccttgc aaaacaggac attatggaat cggattcaat tccgtttatc 5640
atattacaga ctgcccttct tttatttctg gcaatgacat cctgggtatt tttgatcccc 5700
atgccagata tgcaccagga gccacatcag ttagccctgg acgcatgttt agagatttgg 5760
atgcagactt tagaacccag ttctcagatg ttctagatct gtacttggga aaccacttta 5820
aactggacaa ttgtacaatg tttagatttc ctctgcgtaa tgcagagatg gcacaagttt 5880
cagaaatttc ttccgttcca tcatcagaca gaatggtcca gaatcttttg gacaagttac 5940
ggtctgatgg ggcagaactt ctaatgtttc tcaaccacat ggagaaaata tctatttgtg 6000
aaatagataa ggccacagga ggtctgaatg tgctctattc agtaaaaggc aagatcactg 6060
atggagaccg attgaaaagg aagcaattcc acgcctctgt aattgacagt gttactaaaa 6120
agagacagct caaggacata ccagttcaac aaataaccta cactatggat actgaggatt 6180
ctgaaggaaa tctgaccaca tggctcatct gtaatagatc aggattttca agtatggaaa 6240
aagtatccaa gagtgtaata tcagctcaca agaaccaaga tatcaccctt ttcccacgtg 6300
gtggagtagc agcctgcatt actcacaatt ataaaaagcc ccacagagcc ttctgctttc 6360
tgcctctctc tttggagaca gggctgccat ttcatgtgaa tggccacttt gctctagatt 6420
cagccagaag aaacttgtgg cgtgatgata atggggttgg tgttcgaagt gactggaata 6480
atagtttaat gacagcatta atagcacctg catatgttga gttactaatc cagttaaaaa 6540
aacggtattt ccctggttct gacccaacat tatcagtttt acagaacaca cccattcatg 6600
tcgtaaagga cacattaaag aagtttctgt ccttctttcc agttaacagg ctggatctgc 6660
agccggactt atattgctta gtaaaagcac tttacagttg cattcatgaa gacatgaagc 6720
gtcttttgcc tgttgttcgg gctccaaata ttgatggctc agatttgcac tctgcagtca 6780
taattacttg gatcaaatat tctacttcaa ataaaactag accatttttt gataacttac 6840
tacaggatga attacagcac cttaaaaatg cagattataa catcacaact cgaaaaacag 6900
tcgcagagaa tgtctacaga ctgaagcacc tgctcttaga aattggtttc aacttggttt 6960
ataactgtga tgaaactgct aaccttttacc attgccttgt agatgcagat atccctgtca 7020
gctatgtgac tcctgctgat gttaggtcct tcttaatgac tttctcttct cctgacacta 7080
attgccatat tgggaagctg ccttgtcgtc ttcagcagac taacctaaaa cttttcaca 7140
gtttaaaact tttagttgat tactgtttta aagatgctga agaaagtgag tttgaagttg 7200
agggactgcc cctactcatt acactggaca gtgtcttgca gatttttgat ggtaaacgac 7260
ccaagtttct aacaacatac catgaattaa ttccatcgcg taaagacttg tttatgaaca 7320
ccttatactt gaaatacagt agtgttttgt tgaactgcaa agttgcaaaa gtgtttgaca 7380
tttccagctt tgctgactta ctctcttctg tgttgcctcg tgagtacaag accaaaaact 7440
gtgcaaagtg gaaagacaat tttgccagtg aatcttggct taagaacgca tggcatttta 7500
tcagtgaatc agtaagtgta acggatgatc aggaagaacc aaagccagca tttgatgtca 7560
ttgttgacat ccttaaagac tgggcattgc ttccaggaac aaagttcact gtgtcaacca 7620
gtcagcttgt ggttcctgag ggagacgtgt tgattcccct gagcctcatg cacattgctg 7680
tgttcccaaa tgctcagagt gataaggttt ttcacgctct gatgaaagct ggctgtattc 7740
agctggcttt gaacaaaatc tgctctaaag acagcgcatt agttcctctg ttgtcatgcc 7800
acacagcaaa catagatagc cctgcaagca tcttgaaggc tgtgcattat atggttcaga 7860
cgtcaacatt tagaactgaa aaactaatgg aaaatgactt tgaagcactt ttgatgtatt 7920
tcaactgtaa tttgagtcac ttgatgtccc aagatgacat aaaaattta aagtccctcc 7980
catgctacaa atccatcagt ggccgctata tgagcattgc aaaatttgga acgtgctatg 8040
```

```
tgcttaccaa aagtattcct tcagctgaag tggaaaaatg gacacagtca tcctcttccg 8100
cgtttcttga agaaaaggtg catttaaaag aactctatga ggtgcttggc tgtgtgccag 8160
tagatgatct ggaggtgtat ttgaaacatc ttctgccaaa aattgaaaat ctctcttatg 8220
atgcaaagtt ggagcacctg atttatctga agaatagact ggcaagcatc gaggaaccgt 8280
cagagattaa ggagcaactt tttgaaaaac tggaaagctt attgattatc cacgatgcca 8340
acaatcgact aaagcaagca aaacatttct atgacagaac tgtgagagtt tttgaagtta 8400
tgcttcctga aaaattgttt attcctaagg agttctttaa aaaattggaa caagtaatca 8460
aacctaaaaa tcaagctgca tttatgacgt cctgggtgga attcttgaga aatattggac 8520
tgaagtacgc gctctcccag cagcagttgt tacagtttgc caaggaaatc agtgtgaggg 8580
caaatacaga aaactggtct aaagaaaccc tgcaaagtac agttgacatc cttctccatc 8640
acatattcca agaacgaatg gatttgttat ctggaaattt tctgaaagaa ctgtccttaa 8700
taccattctt gtgtcctgaa cgggcccccg ctgagtacat tcggtttcac cctcagtacc 8760
aggaggtaaa cggaacactt cctcttataa agttcaatgg agcacaagtg aatccaaagt 8820
tcaagcaatg tgatgtactc cagctgctgt ggacatcttg ccctattctt ccagagaaag 8880
ccacaccgtt gagcattaaa gaacaagaag gcagtgacct cgctccacag gaacagcttg 8940
aacaagtttt aaatatgctt aatgttaacc tggaccccc tcttgataag gtcattaata 9000
attgcagaaa catatgcaac ataacaactt tggatgagga aatggtaaaa actagagcaa 9060
aggtcctaag gagcatatat gaatttctga gtgcagaaaa acgagagttc cgtttttcagc 9120
ttcggggtgt ggcctttgta atggtagaag acggatggaa acttctgaag cctgaggaag 9180
tagtgataaa cctggagtat gaggctgatt ttaaacctta tctgtacaag ctgccttttag 9240
agcttggcac ttttcatcag ctgttcaaac atttaggtac tgaagatatc atttccacta 9300
agcaatatgt tgaagtgtta agccgaatat tcaaaagctc tggaggaaag cagctagacc 9360
ctaatgaaat gcgtacagtt aagagagtgg tttctggcct attcaagagt ctacaaaatg 9420
attcagtcaa ggtgaggagt gacctggaga atgcccggga gctcgcactc taccttccaa 9480
gccaggatgg gaagttggtg aagtcaagca tcttggtgtt cgatgatgcg ccacattata 9540
aaagtaggat ccaggggaat attggcgtgc agatgctagt tgatcttagc cagtgctact 9600
tagggaaaga ccatggattt cacactaagc tgataatgct ctttcctcaa aagcttcgac 9660
ctcgtctgct gagcagtata cttgaagagc agcttgatga ggagaccct aaagtgtgcc 9720
agtttggcgc attgtgctct cttcaggaa gactgcagct tctcttgtct tcagagcagt 9780
tcatcacagg actcattcga atcatgaagc atgaaatga taatgctttc ctggccaatg 9840
aagaaaaagc cataagactt tgcaaagctc taagagaagg gctgaaagtt tcctgttttg 9900
agaagcttca gacaacatta agggttaaag gttttaatcc tattccccat agcaggagtg 9960
aaactttcgc ttttctaaag cgatttggca atgcagtcat cttgctctac atccaacatt 10020
cagacagcaa agacattaac tttctgctag ccttagcgat gacacttaaa tcagcaactg 10080
acaatttgat ttctgacacg tcatacttaa ttgctatgct gggatgcaat gacatttaca 10140
ggatcagtga gaagcttgac agtttagggg tgaaatacga ctcctctgag ccatcaaaac 10200
tggaactccc catgcctggc acaccaatac ccgctgagat ccattacaca ctacttatgg 10260
atccaatgaa tgtttttttat cctggggaat atgttggtta ccttgtggat gctgaaggtg 10320
gtgatatcta tgggtcatac cagccaacat acacatacgc aattattgtg caagaagttg 10380
aaagagaaga tgctgacaat actagtttct taggaaagat ctatcagatc gatattggct 10440
acagtgaata taagatagtc agctctcttg atctgtacaa gttctcaagg cctgatgaaa 10500
gctcccaaaa cagagacagt gctcccacca caccaacaag ccccaccgaa ttcctgactc 10560
ctggtctgag aagcatccct cctctttct ctggcaagga gagccacaag tctccctcca 10620
ccaaacacca ttcccccaga aagctcaagg tgaatgcttt accagaaatc ttaaaagaag 10680
tgacatcagt ggtgggagcaa gcttggaagc ttccagaatc agagcggaaa aagatcatta 10740
gacgcttgta tttgaagtgg caccctgaca aaaatccaga aaatcatgat attgctaatg 10800
aagtgttcaa gcacctgcag aatgaaatca acagattaga aaaacaggct tttctggatc 10860
aaaatgcaga cagagcttca agaagaacat tttcaacctc tgcatctcga tttcagtcag 10920
acaagtactc atttcaaaga ttttacactt cgtggaatca agaagccaca agtcataaat 10980
ctgaaaggca acagcaaagc aaagagaaat gccctccttc tgctggacag acatactctc 11040
aaaggttctt tgttcctccc accttcaagt cagtgggcaa tccagtggaa gcccggagat 11100
ggttaagaca agccagagca aacttctcag ctgccaggaa tgaccttcac aaaaatgcca 11160
atgaatgggt gtgcttcaag tgttacctt ccaccaagct ggctttgatt gcagccgact 11220
atgctgtcag ggggaaatct gataaagatg taaagccaac tgcacttgca caaaagatag 11280
aggagtacag tcagcagctg gaaggactga caaacgatgt gcacacattg gaagcttatg 11340
gtgtagacag cttgaaaaca aggtaccctg atttgcttcc ttttccgcag attcccaatg 11400
acaggttcac atctgaggtt gccatgaggg tgatggaatg cactgcctgt atcatcataa 11460
aacttgaaaa ttttatacaa cagaaggtgt ga 11492
```

<210> 4
<211> 3830
<212> PRT
<213> Mus musculus

<400> 4

```
Met Asn Thr Phe Trp Pro Gly Arg Glu Leu Val Val Gln Trp Tyr Pro
 1               5                  10                  15
Phe Ser Glu Asp Lys Arg His Pro Ser Leu Ser Trp Leu Lys Met Val
            20                  25                  30
Trp Lys Asn Leu Tyr Ile His Phe Ser Glu Asp Leu Thr Leu Phe Asp
        35                  40                  45
Glu Met Pro Leu Ile Pro Arg Thr Leu Leu Asn Glu Asp Gln Thr Cys
    50                  55                  60
Val Glu Leu Ile Arg Leu Arg Ile Pro Ser Val Val Ile Leu Asp Asp
65                  70                  75                  80
Glu Thr Glu Ala Gln Leu Pro Glu Phe Leu Ala Asp Ile Val Gln Lys
                85                  90                  95
Leu Gly Gly Ile Val Leu Lys Arg Leu Asp Thr Ser Ile Gln His Pro
            100                 105                 110
Leu Val Lys Lys Tyr Ile His Ser Pro Leu Pro Ser Ala Ile Leu Gln
        115                 120                 125
Ile Met Glu Lys Ile Pro Leu Gln Lys Leu Cys Asn Gln Ile Ala Ser
    130                 135                 140
Leu Leu Pro Thr His Lys Asp Ala Leu Arg Lys Phe Leu Ala Ser Leu
145                 150                 155                 160
Thr Asp Thr Ser Glu Lys Glu Lys Arg Ile Ile Gln Glu Leu Thr Ile
                165                 170                 175
Phe Lys Arg Ile Asn His Ser Ser Asp Gln Gly Ile Ser Ser Tyr Thr
            180                 185                 190
Lys Leu Lys Gly Cys Lys Val Leu Asp His Thr Ala Lys Leu Pro Thr
        195                 200                 205
Asp Leu Arg Leu Ser Val Ser Val Ile Asp Ser Ser Asp Glu Ala Thr
    210                 215                 220
Ile Arg Leu Ala Asn Met Leu Lys Ile Glu Lys Leu Lys Thr Thr Ser
225                 230                 235                 240
Cys Leu Lys Phe Val Leu Lys Asp Ile Gly Asn Ala Phe Tyr Thr Gln
            245                 250                 255
Glu Glu Val Thr Gln Leu Met Leu Trp Ile Leu Glu Asn Leu Ser Ser
        260                 265                 270
Leu Lys Asn Glu Asn Ser Asn Val Leu Asp Trp Leu Met Pro Leu Lys
    275                 280                 285
Phe Ile His Met Ser Gln Gly His Val Val Ala Ala Gly Asp Leu Phe
    290                 295                 300
Asp Pro Asp Ile Glu Val Leu Arg Asp Leu Phe Tyr Asn Glu Glu Glu
305                 310                 315                 320
Ala Cys Phe Pro Pro Thr Ile Phe Thr Ser Pro Asp Ile Leu His Ser
            325                 330                 335
Leu Arg Gln Ile Gly Leu Lys Asn Glu Ser Ser Leu Lys Glu Lys Asp
        340                 345                 350
Val Val Gln Val Ala Arg Lys Ile Glu Ala Leu Gln Val Ser Ser Cys
        355                 360                 365
Gln Asn Gln Asp Val Leu Met Lys Lys Ala Lys Thr Leu Leu Leu Val
    370                 375                 380
Leu Asn Lys Asn Gln Thr Leu Leu Gln Ser Ser Glu Gly Lys Met Ala
385                 390                 395                 400
```

```
Leu Lys Lys Ile Lys Trp Val Pro Ala Cys Lys Glu Arg Pro Pro Asn
        405                 410                 415
Tyr Pro Gly Ser Leu Val Trp Lys Gly Asp Leu Cys Asn Leu Cys Ala
        420                 425                 430
Pro Pro Asp Met Cys Asp Ala Ala His Ala Val Leu Val Gly Ser Ser
        435                 440                 445
Leu Pro Leu Val Glu Ser Val His Val Asn Leu Glu Gln Ala Leu Ser
    450                 455                 460
Ile Phe Thr Lys Pro Thr Ile Asn Ala Val Leu Lys His Phe Lys Thr
465                 470                 475                 480
Val Val Asp Trp Tyr Thr Ser Lys Thr Phe Ser Asp Glu Asp Tyr Tyr
            485                 490                 495
Gln Phe Gln His Ile Leu Leu Glu Ile Tyr Gly Phe Met His Asp His
        500                 505                 510
Leu Ser Glu Gly Lys Asp Ser Phe Lys Ala Leu Lys Phe Pro Trp Val
        515                 520                 525
Trp Thr Gly Lys Asn Phe Cys Pro Leu Ala Gln Ala Val Ile Lys Pro
        530                 535                 540
Thr His Asp Leu Asp Leu Gln Pro Tyr Leu Tyr Asn Val Pro Lys Thr
545                 550                 555                 560
Met Ala Lys Phe His Gln Leu Phe Lys Ala Cys Gly Ser Ile Glu Glu
            565                 570                 575
Leu Thr Ser Asp His Ile Ser Met Val Ile Gln Lys Val Tyr Leu Lys
        580                 585                 590
Ser Asp Gln Glu Leu Ser Glu Glu Glu Ser Lys Gln Asn Leu His Leu
        595                 600                 605
Met Leu Asn Ile Met Arg Trp Leu Tyr Ser Asn Gln Ile Pro Ala Ser
    610                 615                 620
Pro Asn Thr Pro Val Pro Ile Tyr His Ser Arg Asn Pro Ser Lys Leu
625                 630                 635                 640
Val Met Lys Pro Ile His Glu Cys Cys Tyr Cys Asp Ile Lys Val Asp
            645                 650                 655
Asp Leu Asn Asp Leu Leu Glu Asp Ser Val Glu Pro Ile Ile Leu Val
            660                 665                 670
His Glu Asp Ile Pro Met Lys Thr Ala Glu Trp Leu Lys Val Pro Cys
        675                 680                 685
Leu Ser Thr Arg Leu Ile Asn Pro Glu Asn Met Gly Phe Glu Gln Ser
    690                 695                 700
Gly Gln Arg Glu Pro Leu Thr Val Arg Ile Lys Asn Ile Leu Glu Glu
705                 710                 715                 720
Tyr Pro Ser Val Ser Asp Ile Phe Lys Glu Leu Leu Gln Asn Ala Asp
            725                 730                 735
Asp Ala Asn Ala Thr Glu Cys Ser Phe Met Ile Asp Met Arg Arg Asn
            740                 745                 750
Met Asp Ile Arg Glu Asn Leu Leu Asp Pro Gly Met Ala Ala Cys His
        755                 760                 765
Gly Pro Ala Leu Trp Ser Phe Asn Asn Ser Glu Phe Ser Asp Ser Asp
    770                 775                 780
Phe Leu Asn Ile Thr Arg Leu Gly Glu Ser Leu Lys Arg Gly Glu Val
785                 790                 795                 800
Asp Lys Val Gly Lys Phe Gly Leu Gly Phe Asn Ser Val Tyr His Ile
            805                 810                 815
Thr Asp Ile Pro Ile Ile Met Ser Arg Glu Phe Met Ile Met Phe Asp
            820                 825                 830
Pro Asn Ile Asn His Ile Ser Lys His Ile Lys Asp Arg Ser Asn Pro
        835                 840                 845
Gly Ile Lys Ile Asn Trp Ser Lys Gln Gln Lys Arg Leu Arg Lys Phe
    850                 855                 860
```

```
Pro Asn Gln Phe Lys Pro Phe Ile Asp Val Phe Gly Cys Gln Leu Pro
865             870             875             880
Leu Ala Val Glu Ala Pro Tyr Ser Tyr Asn Gly Thr Leu Phe Arg Leu
                885             890             895
Ser Phe Arg Thr Gln Gln Glu Ala Lys Val Ser Glu Val Ser Ser Thr
            900             905             910
Cys Tyr Asn Thr Ala Asp Ile Tyr Ser Leu Val Asp Glu Phe Ser Leu
            915             920             925
Cys Gly His Arg Leu Ile Ile Phe Thr Gln Ser Val Asn Ser Met Tyr
            930             935             940
Leu Lys Tyr Leu Lys Ile Glu Glu Thr Asn Pro Ser Leu Ala Gln Asp
945             950             955             960
Thr Ile Ile Ile Lys Lys Lys Val Cys Pro Ser Lys Ala Leu Asn Ala
            965             970             975
Pro Val Leu Ser Val Leu Lys Glu Ala Ala Lys Leu Met Lys Thr Cys
            980             985             990
Ser Ser Ser Asn Lys Lys Leu Pro Thr Asp Val Pro Lys Ser Ser Cys
            995             1000            1005
Ile Leu Gln Ile Thr Val Glu Glu Phe His His Val Phe Arg Arg Ile
            1010            1015            1020
Ala Asp Leu Gln Ser Pro Leu Phe Arg Gly Pro Asp Asp Asp Pro Ala
1025            1030            1035            1040
Thr Leu Phe Glu Met Ala Lys Ser Gly Gln Ser Lys Lys Pro Ser Asp
                1045            1050            1055
Glu Leu Pro Gln Lys Thr Val Asp Cys Thr Thr Trp Leu Ile Cys Thr
            1060            1065            1070
Cys Met Asp Thr Gly Glu Ala Leu Lys Phe Ser Leu Asn Glu Ser Gly
            1075            1080            1085
Arg Arg Leu Gly Leu Val Pro Cys Gly Ala Val Gly Val Leu Leu His
            1090            1095            1100
Glu Thr Gln Glu Gln Lys Trp Thr Val Lys Pro His Ile Gly Glu Val
1105            1110            1115            1120
Phe Cys Tyr Leu Pro Leu Arg Ile Lys Thr Gly Leu Pro Ile His Ile
                1125            1130            1135
Asn Gly Cys Phe Ala Val Thr Ser Asn Arg Lys Glu Ile Trp Lys Thr
                1140            1145            1150
Asp Thr Lys Gly Arg Trp Asn Thr Thr Phe Met Arg His Val Ile Val
            1155            1160            1165
Lys Ala Tyr Leu Gln Ala Leu Ser Val Leu Arg Asp Leu Ala Ile Gly
    1170            1175            1180
Gly Glu Leu Thr Asp Tyr Thr Tyr Tyr Ala Val Trp Pro Asp Pro Asp
1185            1190            1195            1200
Leu Val His Asp Asp Phe Ser Val Ile Cys Lys Gly Phe Tyr Glu Asp
                1205            1210            1215
Ile Ala His Gly Lys Gly Lys Glu Leu Thr Arg Val Phe Ser Asp Gly
            1220            1225            1230
Ser Met Trp Val Ser Met Lys Asn Val Arg Phe Leu Asp Asp Ser Ile
            1235            1240            1245
Leu Gln Arg Lys Asp Val Gly Ser Ala Ala Phe Lys Ile Phe Leu Lys
    1250            1255            1260
Tyr Leu Lys Lys Thr Gly Ser Lys Asn Leu Cys Ala Val Glu Leu Pro
1265            1270            1275            1280
Ser Ser Val Lys Ala Gly Phe Glu Glu Ala Gly Cys Lys Gln Ile Leu
            1285            1290            1295
Leu Glu Asn Thr Phe Ser Glu Lys Gln Phe Phe Ser Glu Val Phe Phe
            1300            1305            1310
Pro Asn Ile Gln Glu Ile Glu Ala Glu Leu Arg Asp Pro Leu Met Asn
        1315            1320            1325
```

```
Phe Val Leu Asn Glu Lys Leu Asp Glu Phe Ser Gly Ile Leu Arg Val
    1330                1335                1340
Thr Pro Cys Val Pro Cys Ser Leu Glu Gly His Pro Leu Val Leu Pro
1345                1350                1355                1360
Ser Arg Leu Ile His Pro Glu Gly Arg Val Ala Lys Leu Phe Asp Thr
                1365                1370                1375
Lys Asp Gly Arg Phe Pro Tyr Gly Ser Thr Gln Asp Tyr Leu Asn Pro
                1380                1385                1390
Ile Ile Leu Ile Lys Leu Val Gln Leu Gly Met Ala Lys Asp Asp Ile
                1395                1400                1405
Leu Trp Asp Asp Met Leu Glu Arg Ala Glu Ser Val Ala Glu Ile Asn
    1410                1415                1420
Lys Ser Asp His Ala Ala Ala Cys Leu Arg Ser Ser Ile Leu Leu Ser
1425                1430                1435                1440
Leu Ile Asp Glu Lys Leu Lys Ile Lys Asp Pro Arg Ala Lys Asp Phe
                1445                1450                1455
Ala Ala Lys Tyr Gln Thr Ile Pro Phe Leu Pro Phe Leu Thr Lys Pro
                1460                1465                1470
Ala Gly Phe Ser Leu Glu Trp Lys Gly Asn Ser Phe Lys Pro Glu Thr
                1475                1480                1485
Met Phe Ala Ala Thr Asp Ile Tyr Thr Ala Glu Tyr Gln Asp Ile Val
    1490                1495                1500
Cys Leu Leu Gln Pro Ile Leu Asn Glu Asn Ser His Ser Phe Arg Gly
1505                1510                1515                1520
Cys Gly Ser Val Ser Leu Ala Val Lys Glu Phe Leu Gly Leu Leu Lys
                1525                1530                1535
Lys Pro Thr Val Asp Leu Val Ile Asn Gln Leu Lys Gln Val Ala Lys
                1540                1545                1550
Ser Val Asp Asp Gly Ile Thr Leu Tyr Gln Glu Asn Ile Thr Asn Ala
    1555                1560                1565
Cys Tyr Lys Tyr Leu His Glu Ala Val Leu Gln Asn Glu Met Ala Lys
    1570                1575                1580
Ala Thr Ile Ile Glu Lys Leu Lys Pro Phe Cys Phe Ile Leu Val Glu
1585                1590                1595                1600
Asn Val Tyr Val Glu Ser Glu Lys Val Ser Phe His Leu Asn Phe Glu
                1605                1610                1615
Ala Ala Pro Tyr Leu Tyr Gln Leu Pro Asn Lys Tyr Lys Asn Asn Phe
                1620                1625                1630
Arg Glu Leu Phe Glu Ser Val Gly Val Arg Gln Ser Phe Thr Val Glu
    1635                1640                1645
Asp Phe Ala Leu Val Leu Glu Ser Ile Asp Gln Glu Arg Gly Lys Lys
    1650                1655                1660
Gln Ile Thr Glu Glu Asn Phe Gln Leu Cys Arg Arg Ile Ile Ser Glu
1665                1670                1675                1680
Gly Ile Trp Ser Leu Ile Arg Glu Lys Arg Gln Glu Phe Cys Glu Lys
                1685                1690                1695
Asn Tyr Gly Lys Ile Leu Leu Pro Asp Thr Asn Leu Leu Leu Leu Pro
                1700                1705                1710
Ala Lys Ser Leu Cys Tyr Asn Asp Cys Pro Trp Ile Lys Val Lys Asp
                1715                1720                1725
Ser Thr Val Lys Tyr Cys His Ala Asp Ile Pro Arg Glu Val Ala Val
    1730                1735                1740
Lys Leu Gly Ala Ile Pro Lys Arg His Lys Ala Leu Glu Arg Tyr Ala
1745                1750                1755                1760
Ser Asn Ile Cys Phe Thr Ala Leu Gly Thr Glu Phe Gly Gln Lys Glu
                1765                1770                1775
Lys Leu Thr Ser Arg Ile Lys Ser Ile Leu Asn Ala Tyr Pro Ser Glu
                1780                1785                1790
```

```
Lys Glu Met Leu Lys Glu Leu Leu Gln Asn Ala Asp Asp Ala Lys Ala
        1795             1800             1805
Thr Glu Ile Cys Phe Val Phe Asp Pro Arg Gln His Pro Val Asp Arg
        1810             1815             1820
Ile Phe Asp Asp Lys Trp Ala Pro Leu Gln Gly Pro Ala Leu Cys Val
1825             1830             1835             1840
Tyr Asn Asn Gln Pro Phe Thr Glu Asp Asp Val Arg Gly Ile Gln Asn
            1845             1850             1855
Leu Gly Lys Gly Thr Lys Glu Gly Asn Pro Cys Lys Thr Gly His Tyr
        1860             1865         —       1870
Gly Ile Gly Phe Asn Ser Val Tyr His Ile Thr Asp Cys Pro Ser Phe
        1875             1880             1885
Ile Ser Gly Asn Asp Ile Leu Gly Ile Phe Asp Pro His Ala Arg Tyr
        1890             1895             1900
Ala Pro Gly Ala Thr Ser Val Ser Pro Gly Arg Met Phe Arg Asp Leu
1905             1910             1915             1920
Asp Ala Asp Phe Arg Thr Gln Phe Ser Asp Val Leu Asp Leu Tyr Leu
            1925             1930             1935
Gly Asn His Phe Lys Leu Asp Asn Cys Thr Met Phe Arg Phe Pro Leu
        1940             1945             1950
Arg Asn Ala Glu Met Ala Gln Val Ser Glu Ile Ser Ser Val Pro Ser
        1955             1960             1965
Ser Asp Arg Met Val Gln Asn Leu Leu Asp Lys Leu Arg Ser Asp Gly
        1970             1975             1980
Ala Glu Leu Leu Met Phe Leu Asn His Met Glu Lys Ile Ser Ile Cys
1985             1990             1995             2000
Glu Ile Asp Lys Ala Thr Gly Gly Leu Asn Val Leu Tyr Ser Val Lys
            2005             2010             2015
Gly Lys Ile Thr Asp Gly Asp Arg Leu Lys Arg Lys Gln Phe His Ala
        2020             2025             2030
Ser Val Ile Asp Ser Val Thr Lys Lys Arg Gln Leu Lys Asp Ile Pro
        2035             2040             2045
Val Gln Gln Ile Thr Tyr Thr Met Asp Thr Glu Asp Ser Glu Gly Asn
        2050             2055             2060
Leu Thr Thr Trp Leu Ile Cys Asn Arg Ser Gly Phe Ser Ser Met Glu
2065             2070             2075             2080
Lys Val Ser Lys Ser Val Ile Ser Ala His Lys Asn Gln Asp Ile Thr
            2085             2090             2095
Leu Phe Pro Arg Gly Gly Val Ala Ala Cys Ile Thr His Asn Tyr Lys
            2100             2105             2110
Lys Pro His Arg Ala Phe Cys Phe Leu Pro Leu Ser Leu Glu Thr Gly
        2115             2120             2125
Leu Pro Phe His Val Asn Gly His Phe Ala Leu Asp Ser Ala Arg Arg
        2130             2135             2140
Asn Leu Trp Arg Asp Asp Asn Gly Val Gly Val Arg Ser Asp Trp Asn
2145             2150             2155             2160
Asn Ser Leu Met Thr Ala Leu Ile Ala Pro Ala Tyr Val Glu Leu Leu
            2165             2170             2175
Ile Gln Leu Lys Lys Arg Tyr Phe Pro Gly Ser Asp Pro Thr Leu Ser
        2180             2185             2190
Val Leu Gln Asn Thr Pro Ile His Val Val Lys Asp Thr Leu Lys Lys
        2195             2200             2205
Phe Leu Ser Phe Phe Pro Val Asn Arg Leu Asp Leu Gln Pro Asp Leu
        2210             2215             2220
Tyr Cys Leu Val Lys Ala Leu Tyr Ser Cys Ile His Glu Asp Met Lys
2225             2230             2235             2240
Arg Leu Leu Pro Val Val Arg Ala Pro Asn Ile Asp Gly Ser Asp Leu
            2245             2250             2255
```

```
His Ser Ala Val Ile Ile Thr Trp Ile Asn Met Ser Thr Ser Asn Lys
        2260                2265                2270
Thr Arg Pro Phe Phe Asp Asn Leu Leu Gln Asp Glu Leu Gln His Leu
        2275                2280                2285
Lys Asn Ala Asp Tyr Asn Ile Thr Thr Arg Lys Thr Val Ala Glu Asn
        2290                2295                2300
Val Tyr Arg Leu Lys His Leu Leu Leu Glu Ile Gly Phe Asn Leu Val
2305                2310                2315                2320
Tyr Asn Cys Asp Glu Thr Ala Asn Leu Tyr His Cys Leu Val Asp Ala
        2325                2330                2335
Asp Ile Pro Val Ser Tyr Val Thr Pro Ala Asp Val Arg Ser Phe Leu
        2340                2345                2350
Met Thr Phe Ser Ser Pro Asp Thr Asn Cys His Ile Gly Lys Leu Pro
        2355                2360                2365
Cys Arg Leu Gln Gln Thr Asn Leu Lys Leu Phe His Ser Leu Lys Leu
        2370                2375                2380
Leu Val Asp Tyr Cys Phe Lys Asp Ala Glu Glu Ser Glu Phe Glu Val
2385                2390                2395                2400
Glu Gly Leu Pro Leu Leu Ile Thr Leu Asp Ser Val Leu Gln Ile Phe
        2405                2410                2415
Asp Gly Lys Arg Pro Lys Phe Leu Thr Thr Tyr His Glu Leu Ile Pro
        2420                2425                2430
Ser Arg Lys Asp Leu Phe Met Asn Thr Leu Tyr Leu Lys Tyr Ser Ser
        2435                2440                2445
Val Leu Leu Asn Cys Lys Val Ala Lys Val Phe Asp Ile Ser Ser Phe
        2450                2455                2460
Ala Asp Leu Leu Ser Ser Val Leu Pro Arg Glu Tyr Lys Thr Lys Asn
2465                2470                2475                2480
Cys Ala Lys Trp Lys Asp Asn Phe Ala Ser Glu Ser Trp Leu Lys Asn
        2485                2490                2495
Ala Trp His Phe Ile Ser Glu Ser Val Ser Val Thr Asp Asp Gln Glu
        2500                2505                2510
Glu Pro Lys Pro Ala Phe Asp Val Ile Val Asp Ile Leu Lys Asp Trp
        2515                2520                2525
Ala Leu Leu Pro Gly Thr Lys Phe Thr Val Ser Thr Ser Gln Leu Val
        2530                2535                2540
Val Pro Glu Gly Asp Val Leu Ile Pro Leu Ser Leu Met His Ile Ala
2545                2550                2555                2560
Val Phe Pro Asn Ala Gln Ser Asp Lys Val Phe His Ala Leu Met Lys
        2565                2570                2575
Ala Gly Cys Ile Gln Leu Ala Leu Asn Lys Ile Cys Ser Lys Asp Ser
        2580                2585                2590
Ala Leu Val Pro Leu Leu Ser Cys His Thr Ala Asn Ile Asp Ser Pro
        2595                2600                2605
Ala Ser Ile Leu Lys Ala Val His Tyr Met Val Gln Thr Ser Thr Phe
        2610                2615                2620
Arg Thr Glu Lys Leu Met Glu Asn Asp Phe Glu Ala Leu Leu Met Tyr
2625                2630                2635                2640
Phe Asn Cys Asn Leu Ser His Leu Met Ser Gln Asp Asp Ile Lys Ile
        2645                2650                2655
Leu Lys Ser Leu Pro Cys Tyr Lys Ser Ile Ser Gly Arg Tyr Met Ser
        2660                2665                2670
Ile Ala Lys Phe Gly Thr Cys Tyr Val Leu Thr Lys Ser Ile Pro Ser
        2675                2680                2685
Ala Glu Val Glu Lys Trp Thr Gln Ser Ser Ser Ser Ala Phe Leu Glu
        2690                2695                2700
Glu Lys Val His Leu Lys Glu Leu Tyr Glu Val Leu Gly Cys Val Pro
2705                2710                2715                2720
```

```
Val Asp Asp Leu Glu Val Tyr Leu Lys His Leu Leu Pro Lys Ile Glu
            2725                2730                2735
Asn Leu Ser Tyr Asp Ala Lys Leu Glu His Leu Ile Tyr Leu Lys Asn
            2740                2745                2750
Arg Leu Ala Ser Ile Glu Glu Pro Ser Glu Ile Lys Glu Gln Leu Phe
            2755                2760                2765
Glu Lys Leu Glu Ser Leu Leu Ile Ile His Asp Ala Asn Asn Arg Leu
            2770                2775                2780
Lys Gln Ala Lys His Phe Tyr Asp Arg Thr Val Arg Val Phe Glu Val
2785                2790                2795                2800
Met Leu Pro Glu Lys Leu Phe Ile Pro Lys Glu Phe Phe Lys Lys Leu
            2805                2810                2815
Glu Gln Val Ile Lys Pro Lys Asn Gln Ala Ala Phe Met Thr Ser Trp
            2820                2825                2830
Val Glu Phe Leu Arg Asn Ile Gly Leu Lys Tyr Ala Leu Ser Gln Gln
            2835                2840                2845
Gln Leu Leu Gln Phe Ala Lys Glu Ile Ser Val Arg Ala Asn Thr Glu
            2850                2855                2860
Asn Trp Ser Lys Glu Thr Leu Gln Ser Thr Val Asp Ile Leu Leu His
2865                2870                2875                2880
His Ile Phe Gln Glu Arg Met Asp Leu Leu Ser Gly Asn Phe Leu Lys
            2885                2890                2895
Glu Leu Ser Leu Ile Pro Phe Leu Cys Pro Glu Arg Ala Pro Ala Glu
            2900                2905                2910
Tyr Ile Arg Phe His Pro Gln Tyr Gln Glu Val Asn Gly Thr Leu Pro
            2915                2920                2925
Leu Ile Lys Phe Asn Gly Ala Gln Val Asn Pro Lys Phe Lys Gln Cys
            2930                2935                2940
Asp Val Leu Gln Leu Leu Trp Thr Ser Cys Pro Ile Leu Pro Glu Lys
2945                2950                2955                2960
Ala Thr Pro Leu Ser Ile Lys Glu Gln Glu Gly Ser Asp Leu Ala Pro
            2965                2970                2975
Gln Glu Gln Leu Glu Gln Val Leu Asn Met Leu Asn Val Asn Leu Asp
            2980                2985                2990
Pro Pro Leu Asp Lys Val Ile Asn Asn Cys Arg Asn Ile Cys Asn Ile
            2995                3000                3005
Thr Thr Leu Asp Glu Glu Met Val Lys Thr Arg Ala Lys Val Leu Arg
            3010                3015                3020
Ser Ile Tyr Glu Phe Leu Ser Ala Glu Lys Arg Glu Phe Arg Phe Gln
3025                3030                3035                3040
Leu Arg Gly Val Ala Phe Val Met Val Glu Asp Gly Trp Lys Leu Leu
            3045                3050                3055
Lys Pro Glu Glu Val Val Ile Asn Leu Glu Tyr Glu Ala Asp Phe Lys
            3060                3065                3070
Pro Tyr Leu Tyr Lys Leu Pro Leu Glu Leu Gly Thr Phe His Gln Leu
            3075                3080                3085
Phe Lys His Leu Gly Thr Glu Asp Ile Ile Ser Thr Lys Gln Tyr Val
            3090                3095                3100
Glu Val Leu Ser Arg Ile Phe Lys Ser Ser Glu Gly Lys Gln Leu Asp
3105                3110                3115                3120
Pro Asn Glu Met Arg Thr Val Lys Arg Val Val Ser Gly Leu Phe Lys
            3125                3130                3135
Ser Leu Gln Asn Asp Ser Val Lys Val Arg Ser Asp Leu Glu Asn Ala
            3140                3145                3150
Arg Asp Leu Ala Leu Tyr Leu Pro Ser Gln Asp Gly Lys Leu Val Lys
            3155                3160                3165
Ser Ser Ile Leu Val Phe Asp Asp Ala Pro His Tyr Lys Ser Arg Ile
            3170                3175                3180
```

```
Gln Gly Asn Ile Gly Val Gln Met Leu Val Asp Leu Ser Gln Cys Tyr
3185                3190                3195                3200
Leu Gly Lys Asp His Gly Phe His Thr Lys Leu Ile Met Leu Phe Pro
          3205                3210                3215
Gln Lys Leu Arg Pro Arg Leu Leu Ser Ser Ile Leu Glu Glu Gln Leu
          3220                3225                3230
Asp Glu Glu Thr Pro Lys Val Cys Gln Phe Gly Ala Leu Cys Ser Leu
          3235                3240                3245
Gln Gly Arg Leu Gln Leu Leu Leu Ser Ser Glu Gln Phe Ile Thr Gly
     3250                3255                3260
Leu Ile Arg Ile Met Lys His Glu Asn Asp Asn Ala Phe Leu Ala Asn
3265                3270                3275                3280
Glu Glu Lys Ala Ile Arg Leu Cys Lys Ala Leu Arg Glu Gly Leu Lys
          3285                3290                3295
Val Ser Cys Phe Glu Lys Leu Gln Thr Thr Leu Arg Val Lys Gly Phe
          3300                3305                3310
Asn Pro Ile Pro His Ser Arg Ser Glu Thr Phe Ala Phe Leu Lys Arg
          3315                3320                3325
Phe Gly Asn Ala Val Ile Leu Leu Tyr Ile Gln His Ser Asp Ser Lys
     3330                3335                3340
Asp Ile Asn Phe Leu Leu Ala Leu Ala Met Thr Leu Lys Ser Ala Thr
3345                3350                3355                3360
Asp Asn Leu Ile Ser Asp Thr Ser Tyr Leu Ile Ala Met Leu Gly Cys
          3365                3370                3375
Asn Asp Ile Tyr Arg Ile Ser Glu Lys Leu Asp Ser Leu Gly Val Lys
          3380                3385                3390
Tyr Asp Ser Ser Glu Pro Ser Lys Leu Glu Leu Pro Met Pro Gly Thr
          3395                3400                3405
Pro Ile Pro Ala Glu Ile His Tyr Thr Leu Leu Met Asp Pro Met Asn
     3410                3415                3420
Val Phe Tyr Pro Gly Glu Tyr Val Gly Tyr Leu Val Asp Ala Glu Gly
3425                3430                3435                3440
Gly Asp Ile Tyr Gly Ser Tyr Gln Pro Thr Tyr Thr Tyr Ala Ile Ile
          3445                3450                3455
Val Gln Glu Val Glu Arg Glu Asp Ala Asp Asn Thr Ser Phe Leu Gly
          3460                3465                3470
Lys Ile Tyr Gln Ile Asp Ile Gly Tyr Ser Glu Tyr Lys Ile Val Ser
          3475                3480                3485
Ser Leu Asp Leu Tyr Lys Phe Ser Arg Pro Asp Glu Ser Ser Gln Asn
     3490                3495                3500
Arg Asp Ser Ala Pro Thr Thr Pro Thr Ser Pro Thr Glu Phe Leu Thr
3505                3510                3515                3520
Pro Gly Leu Arg Ser Ile Pro Pro Leu Phe Ser Gly Lys Glu Ser His
          3525                3530                3535
Lys Ser Pro Ser Thr Lys His His Ser Pro Arg Lys Leu Lys Val Asn
          3540                3545                3550
Ala Leu Pro Glu Ile Leu Lys Glu Val Thr Ser Val Val Glu Gln Ala
          3555                3560                3565
Trp Lys Leu Pro Glu Ser Glu Arg Lys Lys Ile Ile Arg Arg Leu Tyr
     3570                3575                3580
Leu Lys Trp His Pro Asp Lys Asn Pro Glu Asn His Asp Ile Ala Asn
3585                3590                3595                3600
Glu Val Phe Lys His Leu Gln Asn Glu Ile Asn Arg Leu Glu Lys Gln
          3605                3610                3615
Ala Phe Leu Asp Gln Asn Ala Asp Arg Ala Ser Arg Arg Thr Phe Ser
          3620                3625                3630
Thr Ser Ala Ser Arg Phe Gln Ser Asp Lys Tyr Ser Phe Gln Arg Phe
     3635                3640                3645
```

```
Tyr Thr Ser Trp Asn Gln Glu Ala Thr Ser His Lys Ser Glu Arg Gln
    3650             3655             3660
Gln Gln Ser Lys Glu Lys Cys Pro Pro Ser Ala Gly Gln Thr Tyr Ser
3665             3670             3675             3680
Gln Arg Phe Phe Val Pro Pro Thr Phe Lys Ser Val Gly Asn Pro Val
            3685             3690             3695
Glu Ala Arg Arg Trp Leu Arg Gln Ala Arg Ala Asn Phe Ser Ala Ala
        3700             3705             3710
Arg Asn Asp Leu His Lys Asn Ala Asn Glu Trp Val Cys Phe Lys Cys
        3715             3720             3725
Tyr Leu Ser Thr Lys Leu Ala Leu Ile Ala Ala Asp Tyr Ala Val Arg
        3730             3735             3740
Gly Lys Ser Asp Lys Asp Val Lys Pro Thr Ala Leu Ala Gln Lys Ile
3745             3750             3755             3760
Glu Glu Tyr Ser Gln Gln Leu Glu Gly Leu Thr Asn Asp Val His Thr
            3765             3770             3775
Leu Glu Ala Tyr Gly Val Asp Ser Leu Lys Thr Arg Tyr Pro Asp Leu
            3780             3785             3790
Leu Pro Phe Pro Gln Ile Pro Asn Asp Arg Phe Thr Ser Glu Val Ala
        3795             3800             3805
Met Arg Val Met Glu Cys Thr Ala Cys Ile Ile Ile Lys Leu Glu Asn
    3810             3815             3820
Phe Ile Gln Gln Lys Val
3825             3830
```

<210> 5

<400> 5
000

<210> 6

<400> 6
000

<210> 7
<211> 12792
<212> DNA
<213> Homo sapiens

<400> 7
```
atgatttaca ggaagaccat gtactcagct gcagcttcta aatccagaac gatttgcacg  60
tcttatcaag gaagtaatga atacattctg gcctggcaga gaattgattg ttcaatggta 120
tccatttgat gaaaacagaa atcacccatc tgtttcatgg cttaagatgg tttggaaaaa 180
tctttatata catttttcag aggatttgac tttatttgat gagatgccac ttatccccag 240
aactatacta gaggaaggtc agacatgtgt ggaactcatt agactcagga ttccatcgtt 300
agtcatttta gacgatgaat ctgaagcaca gcttccagaa tttttagcag acattgtaca 360
aaaacttgga gggtttgtcc ttaaaaaatt agatgcatct atacaacatc cgcttattaa 420
aaaatatatt cattcaccat taccaagtgc tgttttgcag ataatggaga agatgccatt 480
gcagaaattg tgtaatcaaa taacttcgct acttccaaca cacaaagatg ccctgaggaa 540
gttcttggct agtttaaccg atagcagtga aaagagaaa agaattattc aagaattggc 600
aatattcaag cgcattaacc attcttctga tcagggaatt tcctcttata caaaattgaa 660
aggttgtaaa gtcttacacc atactgccaa actcccagca gatctgcgac tttctatttc 720
agtaatagac agtagtgatg aagctactat tcgtctggca aacatgttga aaatagaaca 780
gttaaagacc actagctgct aaagcttgt tttaaaagat attgaaaatg catttttattc 840
acatgaagag gtaacacagc ttatgttatg ggtccttgag aatctatctt ctcttaaaaa 900
tgagaatcca aatgtgcttg agtggttaac accattaaaa ttcatccaga tatcacagga 960
```

```
acagatggta tcagctggtg aactctttga ccctgatata gaagtactaa aggatctctt 1020
ttgtaatgaa gaaggaacct atttcccacc ctcagttttt acctcaccag atattcttca 1080
ctccttaaga cagattggtt taaaaaacga agccagtctc aaagaaaagg atgttgtgca 1140
agtggcaaaa aaaattgaag ccttacaggt cggtgcttgt cctgatcaag atgttcttct 1200
gaagaaagcc aaaaccctct tactggtttt aaataagaat cacacactgt tgcaatcatc 1260
tgaaggaaag atgacattga agaaaataaa atgggttcca gcctgcaagg aaaggcctcc 1320
aaattatcca ggctctttgg tctggaaagg agatctctgt aatctctgtg caccaccaga 1380
tatgtgtgat gtaggccatg caattctcat tggctcctca cttcctcttg ttgaaagtat 1440
ccatgtaaac ctggaaaaag cattagggat cttcacaaaa cctagcctta gtgctgtctt 1500
aaaacacttt aaaattgttg ttgattggta ttcttcaaaa acctttagtg atgaagacta 1560
ctatcaattc cagcatattt tgcttgagat ttacggattc atgcatgatc atctaaatga 1620
agggaaagat tcttttagag ccttaaaatt tccatgggtt tggactggca aaaagttttg 1680
tccacttgcc caggctgtga ttaaaccaat ccatgatctt gacctcagc cttatttgca 1740
taatgtacct aaaaccatgg caaaattcca ccaactattt aaggtctgtg gttcaataga 1800
ggagttgaca tcagatcata tttccatggt tattcagaag atatatctca aaagtgacca 1860
agatctcagt gaacaagaaa gcaaacaaaa tcttcatctt atgttgaata ttatcagatg 1920
gctgtatagc aatcagattc cagcaagccc caacacacca gttcctatac atcatagcaa 1980
aaatccttct aaacttatca tgaagccaat tcacgaatgc tgttattgtg acattaaagt 2040
tgatgacctt aatgacttac ttgaagattc tgtggaacca atcattttgg tgcatgagga 2100
catacccatg aaaactgcag aatggctaaa agttccatgc cttagtacaa gactgataaa 2160
tcctgaaaac atgggatttg agcagtcagg acaaagagag ccacttactg taagaattaa 2220
aaatattctg gaagaatacc cttcagtgtc agatattttt aaagaactac ttcaaaacgc 2280
tgatgatgca aatgcaacga aatgcagttt cttgattgat atgagaagaa atatggacat 2340
aagagagaat ctcctagacc cagggatggc agcttgtcat ggacctgctt tgtggtcatt 2400
caacaattct caattctcag attcagattc tgtgaacata actaggttag gagaatcttt 2460
aaaaaggggga gaagttgaca aagttggaaa atttggtctt ggatttaatt ctgtgtacca 2520
tatcactgac attcccatca ttatgagtcg ggaattcatg ataatgttcg atccaaacat 2580
aaatcatatc agtaaacaca ttaaagacaa atccaatcct gggatcaaaa ttaattggag 2640
taaacaacag aaaagactta gaaaatttcc taatcagttc aaaccattta tagatgtatt 2700
tggctgtcag ttacctttga ctgtagaagc accttacagc tataatggaa cccttttccg 2760
actgtccttt agaactcaac aggaagcaaa agtgagtgaa gttagtagta cgtgctacaa 2820
tacagcagat atttattctc ttgtggatga atttagtctc tgtggacaca ggcttatcat 2880
tttcactcag agtgtaaagt caatgtattt gaagtacttg aaaattgagg aaaccaaccc 2940
cagtttagca caagatacag taataattaa aaaaaaatcc tgctcttcca aagcattgaa 3000
cacacctgtc ttaagtgttt taaaagaggc tgctaagctc atgaagactt gcagcagcag 3060
taataaaaag cttcccagtg atgaaccaaa gtcatcttgc attcttcaga tcacagtgga 3120
agaatttcac catgtgttca gaaggattgc tgatttacag tcgccacttt ttagaggtcc 3180
agatgatgac ccagctgctc tctttgaaat ggctaagtct ggccaatcaa aaaagccatc 3240
agatgagttg tcacagaaaa cagtagagtg taccacgtgg cttctgtgta cttgcatgga 3300
cacaggagag gctctgaagt tttcctgag tgagagtgga agaagactag gactggttcc 3360
atgtggggca gtaggagttc agctgtcaga aatccaggac cagaagtgga cagtgaaacc 3420
acacattgga gaggtgtttt gctatttacc tttacgaata aaaacaggct tgccagttca 3480
tatcaatggg tgctttgctg ttacatcaaa taggaaagaa atctggaaaa cagatacaaa 3540
aggacgatgg aataccacgt tcatgagaca tgttattgtg aaagcttact tacaggtact 3600
gagtgtctta cgggacctgg ccactagtgg ggagctaatg gattatactt actatgcagt 3660
atggcccgat cctgatttag ttcatgatga tttttctgta atttgccaag gattttatga 3720
agatatagct catggaaaag ggaaagaact gaccaaagtc ttctctgatg gatctacttg 3780
ggtttccatg aagaacgtaa gatttctaga tgactctata cttaaaagaa gagatgttgg 3840
ttcagcagcc ttcaagatat ttttgaaata cctcaagaag actgggtcca aaaacctttg 3900
tgctgttgaa cttccttctt cggtaaaatt aggatttgaa gaagctggct gcaaacagat 3960
actacttgaa aacacattct cagagaaaca gttttttct gaagtgtttt ttccaaatat 4020
tcaagaaatt gaagcagaac ttagagatcc tttaatgatc tttgttctaa atgaaaaagt 4080
tgatgagttc tcgggagttc ttcgtgttac tccatgtatt ccttgttcct ggaggggca 4140
tcctttggtt ttgccatcaa gattgatcca ccccgaagga cgagttgcaa agttatttga 4200
tattaaagat gggagattcc cttatggttc tactcaggat tatctcaatc ctattatttt 4260
gattaaacta gttcagttag gtatggcaaa agatgatatt ttatgggatg atatgctaga 4320
acgtgcagtg tcagtagctg aaattaataa aagtgatcat gttgctgcat gcctaagaag 4380
tagtatctta ttgagtctta tcgatgagaa actaaaaata agggatccta gagcaaagga 4440
```

```
ttttgctgca aaatatcaaa caatccgctt ccttccattt ctgacaaaac cagcaggttt 4500
ttctttggac tggaaaggca acagttttaa gcctgaaacc atgtttgcag caactgacct 4560
ttatacagct gaacatcaag atatagtttg tcttttgcaa ccaattctaa atgaaaattc 4620
ccattctttt agaggttgtg gttcagtgtc attggctgtt aaagagtttt tgggattact 4680
caagaagcca acagttgatc tggttataaa ccaattgaaa gaagtagcaa aatcagttga 4740
tgatggaatt acactgtacc aggagaatat caccaatgct tgctacaaat accttcatga 4800
agccttgatg caaaatgaaa tcactaagat gtcaattatt gataagttaa aaccctttag 4860
cttcattcta gttgagaatg catatgttga ctcagaaaag gtttcttttc atttaaattt 4920
tgaggcggca ccataccttt atcagttgcc taataagtat aaaaataatt tccgcgaact 4980
ttttgaaacc gtgggtgtga ggcagtcatg cactgttgaa gattttgctc ttgttttgga 5040
atctattgat caagaaagag gaacaaagca aataacagaa gagaattttc agctttgccg 5100
acgaataatc agtgaaggaa tatggagtct cattagagaa aagaaacaag aattttgtga 5160
gaaaaattat ggcaagatat tattgccaga tactaatctt atgcttctcc ctgctaaatc 5220
gttatgctac aatgattgcc cttggataaa agtaaaggat accacgtaa aatattgtca 5280
tgctgacata cccagggaag tagcagtaaa actaggagca gtcccaaagc gacacaaagc 5340
cttagaaaga tatgcatcca atgtctgttt tacaacactt ggcacagaat ttgggcagaa 5400
agaaaaattg accagcagaa ttaagagcat ccttaatgca tatccttctg aaaaggaaat 5460
gttgaaagag cttcttcaaa atgctgatga tgcaaaggcg acagaaatct gttttgtgtt 5520
tgatcctaga cagcatccag ttgatagaat atttgatgat aagtgggccc cattgcaagg 5580
gccagcactt tgtgtgtaca acaaccagcc atttacagaa gatgatgtta gaggaattca 5640
gaatcttgga aaaggcacga aagagggaaa tccttataaa actggacagt atggaatagg 5700
attcaattct gtgtatcata tcacagactg cccatctttt atttctggca atgacatcct 5760
gtgtattttt gatcctcatg ccagatatgc accagggcc acatccatta gtcccggacg 5820
catgtttaga gatttggatg cagattttag gacacagttc tcagatgttc tggatctttta 5880
tctgggaacc cattttaaac tggataattg cacaatgttc agatttcctc ttcgtaatgc 5940
agaaatggca aaagtttcgg aaatttcgtc tgttccagca tcagacagaa tggtccagaa 6000
tcttttggac aaactgcgct cagatggggc agaacttcta atgtttctta atcacatgga 6060
aaaaatttct atttgtgaaa tagataagag tactggagct ctaaatgtgc tgtattcagt 6120
aaagggcaaa atcacagatg gagacagatt gaaaaggaaa caatttcatg catctgtaat 6180
tgatagtgtt actaaaaaga ggcagctcaa agacatacca gttcaacaaa taacctatac 6240
tatggatact gaggactctg aaggaaatct tactacgtgg ctaatttgta atagatcagg 6300
cttttcaagt atggagaaag tatctaaaag tgtcatatca gctcacaaga accaagatat 6360
tactcttttc ccacgtggtg gagtagctgc ctgcattact cacaactata aaaaacccca 6420
tagggccttc tgttttttgc ctcttttctt ggagactggg ctgccatttc atgtgaatgg 6480
ccactttgca ctggattcag ccagaaggaa cctgtggcgt gatgataatg gagttggtgt 6540
tcgaagtgac tggaataaca gtttaatgac agcattaata gctcctgcat atgtgaattg 6600
ctaatacagt taaaaaaacg gtattccct ggttctgatc caacattatc agtgttacag 6660
aacacccta ttcatgttgt aaaggacact ttaaagaagt ttttatcgtt tttcccagtt 6720
aaccgtcttg atctacagcc agtttatat tgtctagtga aagcacttta caattgcatt 6780
cacgaagaca tgaaacgtct ttacctgtt gtgcgggctc caaatattga tggctctgac 6840
ttgcactctg cagttataat tacttggatc aatatgtcta cttctaataa aactagacca 6900
tttttttgaca atttactaca ggatgaatta caacacctta aaaatgcaga ttataatatc 6960
accacacgca aaacagtagc agagaatgtc tataggctga aacatctcct tttagaaatt 7020
ggtttcaact tggtttataa ctgtgatgaa actgctaatc tttaccactg tcttatagat 7080
gcagatattc ctgttagtta tgtgaccct gctgatatca gatcttttt aatgacattt 7140
tcctctcctg acactaattg ccatattggg aagctgcctt gtcgtctgca gcagactaat 7200
ctaaactttt ttcatagttt aaaactttta gttgattatt gttttaaaga tgcagaagaa 7260
aatgagattg aagttgaggg attgcccctt ctcatcacac tggacagtgt tttgcaaact 7320
tttgatgcaa aacgaccaa gttctaaca acatatcatg aattgattcc atcccgcaaa 7380
gacttgttta tgaatacatt atatttgaaa tatagtaata ttttattgaa ctgtaaagtt 7440
gcaaaagtgt ttgacatttc cagctttgct gatttgttat cctctgtgtt gcctcgagaa 7500
tataagacca aaggttgcac aaagtggaaa gacaattttg caagtgagtc ttggcttaag 7560
aatgcatggc atttattag tgaatctgta agtgtgaaag aagatcagga agaaacaaaa 7620
ccaacatttg acattgttgt tgatactcta aaagactggg cattgcttcc aggaacaaag 7680
tttactgttt cagccaacca gcttgtggtt cctgaaggag atgttctgct tcctctcagc 7740
cttatgcaca ttgcagtttt tccaaatgcc cagagtgata aagttttca tgctctaatg 7800
aaagccggct gtattcagct tgctttgaac aaaatctgtt ccaaagacag tgcatttgtt 7860
cctttgttgt catgtcacac agcaaatata gagagcccca caagcatctt gaaggctcta 7920
```

```
cattatatgg tccaaacttc aacatttaga gcagaaaaat tagtagaaaa tgattttgag 7980
gcacttttga tgtatttcaa ctgcaatttg aatcatttga tgtcccaaga tgatataaaa 8040
attctaaagt cacttccgtg ctataaatcc atcagtggcc gctatgtaag cattggaaaa 8100
tttggaacat gctacgtact tacaaaaagt atcccttcag ctgaagtgga gaaatggaca 8160
caatcatcat catctgcatt tcttgaagaa aaaatacact taaaagaact atatgaggtg 8220
attggttgtg tacctgtaga tgatcttgag gtatatttga aacacctctt accaaaaatt 8280
gaaaatctct cttatgatgc aaaattagag cacttgatct accttaagaa tagattatca 8340
agtgctgagg aattatcaga gattaaggaa caacttttg aaaaactgga aagtttattg 8400
ataatccatg atgctaacag tagactaaag caagcaaagc atttctatga tagaactgtg 8460
agagtttttg aagttatgct tcctgaaaaa ttgtttattc ctaatgattt ctttaagaaa 8520
ttggaacaac ttataaaacc caaaaatcat gttacattta tgacatcctg ggtggaattc 8580
ttaagaaata ttggactaaa atacatactt tctcagcagc agttgttaca gtttgctaag 8640
gaaatcagtg tgagggctaa tacagaaaac tggtccaaag aaacattgca aaatacagtt 8700
gatatccttc tgcatcatat attccaagaa cgaatggatt tgttatctgg aaattttctg 8760
aaagaactat ctttaatacc attcttatgt cctgagcggg ccccgcgga attcattaga 8820
tttcatcctc aatatcaaga ggtaaatgga acacttcctc ttataaagtt caatggagca 8880
caggtaaatc caaaattcaa gcaatgtgat gtactccagc tgttatggac atcctgccct 8940
attcttccag agaaagctac acccttaagc attaaagaac aagaaggtag tgaccttggt 9000
ccacaagaac agcttgaaca agtttaaat atgcttaatg ttaacctgga tcctcctctt 9060
gataaggtaa tcaataactg cagaaacata tgcaacataa cgacgttgga tgaagaaatg 9120
gtaaaaacta gagcaaaagt cttaaggagc atatatgaat tcctcagtgc agaaaaaagg 9180
gaatttcgtt ttcagttgcg aggggttgct tttgtgatgg tagaagatgg ttggaaactt 9240
ctgaagcctg aggaggtagt cataaaccta gaatatgaat ctgattttaa accttatttg 9300
tacaagctac ctttagaact tggcacattt caccagttgt tcaaacactt aggtactgaa 9360
gatattattt caactaagca atatgttgaa gtgttgagcc gcatatttaa aaattctgag 9420
ggcaaacaat tagatcctaa tgaaatgcgt acagttaaga gagtagtttc tggtctgttc 9480
aggagtctac agaatgattc agtcaaggtg aggagtgatc tcgagaatgt acgagacctt 9540
gcgctttacc tcccaagcca ggatggtaga ttggtaaagt caagcatctt agtgtttgac 9600
gatgcgccac attataaaag tagaatccag gggaatattg gtgtgcaaat gttagttgat 9660
ctcagccagt gctacttagg gaaagaccat ggatttcaca ctaagttgat aatgctcttt 9720
cctcaaaaac ttagacctcg attattgagc agtatacttg aagaacaatt agatgaagag 9780
actcccaaag tttgtcagtt tggagcgttg tgttctcttc aaggaagatt gcagttactc 9840
ttgtcttctg aacagttcat tacaggactg attagaatta tgaagcatga aaatgataat 9900
gctttctgg ccaatgaaga aaaagccata agactttgca aagccctaag agaaggattg 9960
aaagtatcct gctttgaaaa gcttcaaaca acattaagag ttaaaggttt taatcctatt 10020
ccccacagca gaagtgaaac ttttgctttt ttgaagcgat ttggtaatgc agtcatcttg 10080
ctctacattc aacattcaga cagtaaagac attaatttcc tgttagcact ggcaatgact 10140
cttaaatcag caactgacaa tttgatttct gacacttcat atttaattgc tatgctagga 10200
tgcaatgata tttacaggat tggtgagaaa cttgacagtt taggagtgaa atatgactct 10260
tcggagccat caaaactgga acttccaatg cctggcacac caattcctgc tgaaattcat 10320
tacactctgc ttatggaccc aatgaatgtt tttacccgg gagaatatgt tgggtacctt 10380
gttgatgctg aaggtggtga tatctatgga tcataccagc caacatacac atatgcaatt 10440
attgtacaag aagttgaaag agaagatgct gacaattcta gttttctagg aaagatatat 10500
cagatagata ttggttatag tgaatataaa atagttagct ctcttgatct gtataagttt 10560
tcaagacctg aggaaagctc tcaaagcagg gacagtgctc cttctacacc aaccagcccc 10620
actgagttcc tcacccctgg cctgagaagc attcctcctc ttttctctgg tagagagagc 10680
cacaagactt cttccaaaca tcagtccccc aaaaagctta aggttaattc tttaccagaa 10740
atcttaaaag aagtgacatc tgtggtggag caagcatgga agcttccaga atcggaacga 10800
aaaaagatta ttaggcggtt gtatttgaaa tggcatcctg acaaaaatcc agagaaccat 10860
gacattgcca atgaagtttt taaacatttg cagaatgaaa tcaacagatt agaaaaacag 10920
gctttctag atcaaaatgc agacagggcc tccagacgaa cattttcaac ctcagcatcc 10980
cgatttcagt cagacagata ctcatttcag agattctata cttcatggaa tcaagaagca 11040
acgagccata aatctgaaag acagcaacag aacaaagaaa aatgcccccc ttcagccgga 11100
cagacttact ctcaaaggtt ctttgttcct cccactttca agtcggttgg caatccagtg 11160
gaagcacgca gatggctaag acaagccaga gcaaacttct cagctgccag gaatgacctt 11220
cataaaaatg ccaatgagtg ggtgtgcttt aaatgttacc tttctaccaa gttagctttg 11280
attgcagctg actatgctgt gaggggaaag tctgataaag atgtaaaacc aactgcactt 11340
gctcagaaaa tagaggaata tagtcagcaa cttgaaggac tgacaaatga tgttcacaca 11400
```

```
ttggaagctt atggtgtaga cagtttaaaa acaagatacc ctgatttgct tccctttcct 11460
cagatcccaa atgacaggtt cacttctgag gttgctatga gggtgatgga atgtactgcc 11520
tgtatcataa taaaacttga aaattttatg caacaaaaag tgtgaagata tttaacgaaa 11580
aaaaaggtag atcttgaatg tgttgtagca cgaataaatt gctgtacttc attaagcttc 11640
attgccaatt agctaggaat tgttaagcac attgcagatt gttcttggag aattctggag 11700
ttgttatgaa catgaatacc aacggaaaac cttaactgaa tctaaaagaa aactattttg 11760
aagatggtgg tgagctgcaa aatagctgga tggatttgaa tgattgggat gaacatcat 11820
tgaactgcac tttatataac caaagcttag cagtttgtta gataagagtc tatgtatgtc 11880
tctggttagg atgaagttaa ttttatgttt ttaacatggt attttttgaag gagctaatga 11940
aacactggac atataattgg tttaaacata aggggaatta agtctttgta gtctgtcatt 12000
tttttaagtg gatcctcttg gatgcgttat tttctcatca gctggctctg atcatgaatt 12060
tgttgtaatt ttatgttgta ctcagtgcat ttaagaaatg gtagagtatt ttaatcctat 12120
tacttgacta agagtgtgaa ggtagtactt tttagagtgc actgagtgca ctttacatct 12180
ttatttaaat tttttttttaa catcttatgt ttacaggctt cctgtttgat gaagatagca 12240
acggaaaact caaaatggtg gcagttctta ttaccagttg ttagtattgt ttctggaaac 12300
tgcttgccaa gacaacattt attaactgtt agaacacttg ctttatgttt gtgtgtacat 12360
attttccaca aatgttataa tttatatagt gtggttgaac aggatgcaat ctttttgttgt 12420
ctaaaggtgc tgcagttaaa aaaaaaacaa cctttttcttt caatatggca tgtagtggag 12480
tttttttaac tttaaaaaca tcaaaaattg ttaaaatcat tgtgttatct agtagtttat 12540
aattatcggc ttatatttcc ccatgaatga tcagaactga catttaattc atgtttgtct 12600
cgccatgctt ctttacttta acatatttct tttgcagaat gtaaaaggta atgataatta 12660
gtttatataa gtgtactggc tgtaaatgat gctaaatata ctttatgcaa ttaagggctt 12720
acagaacatg ttgaaacttt ttttactttt attgggaata aggaatgttt gcacctccac 12780
attttattgc tt                                                     12792
```

<210> 8
<211> 3707
<212> PRT
<213> Homo sapiens

<400> 8

```
Met Asn Thr Phe Trp Pro Gly Arg Glu Leu Ile Val Gln Trp Tyr Pro
1               5                   10                  15
Phe Asp Glu Asn Arg Asn His Pro Ser Val Ser Trp Leu Lys Met Val
            20                  25                  30
Trp Lys Asn Leu Tyr Ile His Phe Ser Glu Asp Leu Thr Leu Phe Asp
        35                  40                  45
Glu Met Pro Leu Ile Pro Arg Thr Ile Leu Glu Glu Gly Gln Thr Cys
    50                  55                  60
Val Glu Leu Ile Arg Leu Arg Ile Pro Ser Leu Val Ile Leu Asp Asp
65                  70                  75                  80
Glu Ser Glu Ala Gln Leu Pro Glu Phe Leu Ala Asp Ile Val Gln Lys
                85                  90                  95
Leu Gly Gly Phe Val Leu Lys Lys Leu Asp Ala Ser Ile Gln His Pro
            100                 105                 110
Leu Ile Lys Lys Tyr Ile His Ser Pro Leu Pro Ser Ala Val Leu Gln
        115                 120                 125
Ile Met Glu Lys Met Pro Leu Gln Lys Leu Cys Asn Gln Ile Thr Ser
    130                 135                 140
Leu Leu Pro Thr His Lys Asp Ala Leu Arg Lys Phe Leu Ala Ser Leu
145                 150                 155                 160
Thr Asp Ser Ser Glu Lys Glu Lys Arg Ile Ile Gln Glu Leu Ala Ile
                165                 170                 175
Phe Lys Arg Ile Asn His Ser Ser Asp Gln Gly Ile Ser Ser Tyr Thr
            180                 185                 190
```

```
Lys Leu Lys Gly Cys Lys Val Leu His His Thr Ala Lys Leu Pro Ala
        195             200             205
Asp Leu Arg Leu Ser Ile Ser Val Ile Asp Ser Ser Asp Glu Ala Thr
        210             215             220
Ile Arg Leu Ala Asn Met Leu Lys Ile Glu Gln Leu Lys Thr Thr Ser
225             230             235             240
Cys Leu Lys Leu Val Leu Lys Asp Ile Glu Asn Ala Phe Tyr Ser His
            245             250             255
Glu Glu Val Thr Gln Leu Met Leu Trp Val Leu Glu Asn Leu Ser Ser
            260             265             270
Leu Lys Asn Glu Asn Pro Asn Val Leu Glu Trp Leu Thr Pro Leu Lys
            275             280             285
Phe Ile Gln Ile Ser Gln Glu Gln Met Val Ser Ala Gly Glu Leu Phe
        290             295             300
Asp Pro Asp Ile Glu Val Leu Lys Asp Leu Phe Cys Asn Glu Glu Gly
305             310             315             320
Thr Tyr Phe Pro Pro Ser Val Phe Thr Ser Pro Asp Ile Leu His Ser
            325             330             335
Leu Arg Gln Ile Gly Leu Lys Asn Glu Ala Ser Leu Lys Glu Lys Asp
        340             345             350
Val Val Gln Val Ala Lys Lys Ile Glu Ala Leu Gln Val Gly Ala Cys
        355             360             365
Pro Asp Gln Asp Val Leu Leu Lys Lys Ala Lys Thr Leu Leu Leu Val
        370             375             380
Leu Asn Lys Asn His Thr Leu Leu Gln Ser Ser Glu Gly Lys Met Thr
385             390             395             400
Leu Lys Lys Ile Lys Trp Val Pro Ala Cys Lys Glu Arg Pro Pro Asn
            405             410             415
Tyr Pro Gly Ser Leu Val Trp Lys Gly Asp Leu Cys Asn Leu Cys Ala
            420             425             430
Pro Pro Asp Met Cys Asp Val Gly His Ala Ile Leu Ile Gly Ser Ser
        435             440             445
Leu Pro Leu Val Glu Ser Ile His Val Asn Leu Glu Lys Ala Leu Gly
        450             455             460
Ile Phe Thr Lys Pro Ser Leu Ser Ala Val Leu Lys His Phe Lys Ile
465             470             475             480
Val Val Asp Trp Tyr Ser Ser Lys Thr Phe Ser Asp Glu Asp Tyr Tyr
            485             490             495
Gln Phe Gln His Ile Leu Leu Glu Ile Tyr Gly Phe Met His Asp His
        500             505             510
Leu Asn Glu Gly Lys Asp Ser Phe Arg Ala Leu Lys Phe Pro Trp Val
        515             520             525
Trp Thr Gly Lys Lys Phe Cys Pro Leu Ala Gln Ala Val Ile Lys Pro
    530             535             540
Ile His Asp Leu Asp Leu Gln Pro Tyr Leu His Asn Val Pro Lys Thr
545             550             555             560
Met Ala Lys Phe His Gln Leu Phe Lys Val Cys Gly Ser Ile Glu Glu
            565             570             575
Leu Thr Ser Asp His Ile Ser Met Val Ile Gln Lys Ile Tyr Leu Lys
        580             585             590
Ser Asp Gln Asp Leu Ser Glu Gln Glu Ser Lys Gln Asn Leu His Leu
        595             600             605
Met Leu Asn Ile Ile Arg Trp Leu Tyr Ser Asn Gln Ile Pro Ala Ser
    610             615             620
Pro Asn Thr Pro Val Pro Ile His His Ser Lys Asn Pro Ser Lys Leu
625             630             635             640
Ile Met Lys Pro Ile His Glu Cys Cys Tyr Cys Asp Ile Lys Val Asp
            645             650             655
```

```
Asp Leu Asn Asp Leu Leu Glu Asp Ser Val Glu Pro Ile Ile Leu Val
        660             665             670
His Glu Asp Ile Pro Met Lys Thr Ala Glu Trp Leu Lys Val Pro Cys
        675             680             685
Leu Ser Thr Arg Leu Ile Asn Pro Glu Asn Met Gly Phe Glu Gln Ser
    690             695             700
Gly Gln Arg Glu Pro Leu Thr Val Arg Ile Lys Asn Ile Leu Glu Glu
705             710             715             720
Tyr Pro Ser Val Ser Asp Ile Phe Lys Glu Leu Leu Gln Asn Ala Asp
                725             730             735
Asp Ala Asn Ala Thr Glu Cys Ser Phe Leu Ile Asp Met Arg Arg Asn
            740             745             750
Met Asp Ile Arg Glu Asn Leu Leu Asp Pro Gly Met Ala Ala Cys His
        755             760             765
Gly Pro Ala Leu Trp Ser Phe Asn Asn Ser Gln Phe Ser Asp Ser Asp
    770             775             780
Phe Val Asn Ile Thr Arg Leu Gly Glu Ser Leu Lys Arg Gly Glu Val
785             790             795             800
Asp Lys Val Gly Lys Phe Gly Leu Gly Phe Asn Ser Val Tyr His Ile
            805             810             815
Thr Asp Ile Pro Ile Ile Met Ser Arg Glu Phe Met Ile Met Phe Asp
        820             825             830
Pro Asn Ile Asn His Ile Ser Lys His Ile Lys Asp Lys Ser Asn Pro
        835             840             845
Gly Ile Lys Ile Asn Trp Ser Lys Gln Gln Lys Arg Leu Arg Lys Phe
    850             855             860
Pro Asn Gln Phe Lys Pro Phe Ile Asp Val Phe Gly Cys Gln Leu Pro
865             870             875             880
Leu Thr Val Glu Ala Pro Tyr Ser Tyr Asn Gly Thr Leu Phe Arg Leu
            885             890             895
Ser Phe Arg Thr Gln Gln Glu Ala Lys Val Ser Glu Val Ser Ser Thr
        900             905             910
Cys Tyr Asn Thr Ala Asp Ile Tyr Ser Leu Val Asp Glu Phe Ser Leu
    915             920             925
Cys Gly His Arg Leu Ile Ile Phe Thr Gln Ser Val Lys Ser Met Tyr
    930             935             940
Leu Lys Tyr Leu Lys Ile Glu Glu Thr Asn Pro Ser Leu Ala Gln Asp
945             950             955             960
Thr Val Ile Ile Lys Lys Lys Ser Cys Ser Ser Lys Ala Leu Asn Thr
            965             970             975
Pro Val Leu Ser Val Leu Lys Glu Ala Ala Lys Leu Met Lys Thr Cys
        980             985             990
Ser Ser Ser Asn Lys Lys Leu Pro Ser Asp Glu Pro Lys Ser Ser Cys
        995             1000            1005
Ile Leu Gln Ile Thr Val Glu Glu Phe His His Val Phe Arg Arg Ile
    1010            1015            1020
Ala Asp Leu Gln Ser Pro Leu Phe Arg Gly Pro Asp Asp Asp Pro Ala
1025            1030            1035            1040
Ala Leu Phe Glu Met Ala Lys Ser Gly Gln Ser Lys Lys Pro Ser Asp
            1045            1050            1055
Glu Leu Ser Gln Lys Thr Val Glu Cys Thr Thr Trp Leu Leu Cys Thr
            1060            1065            1070
Cys Met Asp Thr Gly Glu Ala Leu Lys Phe Ser Leu Ser Glu Ser Gly
        1075            1080            1085
Arg Arg Leu Gly Leu Val Pro Cys Gly Ala Val Gly Val Gln Leu Ser
    1090            1095            1100
Glu Ile Gln Asp Gln Lys Trp Thr Val Lys Pro His Ile Gly Glu Val
1105            1110            1115            1120
```

```
Phe Cys Tyr Leu Pro Leu Arg Ile Lys Thr Gly Leu Pro Val His Ile
              1125                1130                1135
Asn Gly Cys Phe Ala Val Thr Ser Asn Arg Lys Glu Ile Trp Lys Thr
              1140                1145                1150
Asp Thr Lys Gly Arg Trp Asn Thr Thr Phe Met Arg His Val Ile Val
            1155                1160                1165
Lys Ala Tyr Leu Gln Val Leu Ser Val Leu Arg Asp Leu Ala Thr Ser
        1170                1175                1180
Gly Glu Leu Met Asp Tyr Thr Tyr Tyr Ala Val Trp Pro Asp Pro Asp
1185                1190                1195                1200
Leu Val His Asp Asp Phe Ser Val Ile Cys Gln Gly Phe Tyr Glu Asp
              1205                1210                1215
Ile Ala His Gly Lys Gly Lys Glu Leu Thr Lys Val Phe Ser Asp Gly
              1220                1225                1230
Ser Thr Trp Val Ser Met Lys Asn Val Arg Phe Leu Asp Asp Ser Ile
              1235                1240                1245
Leu Lys Arg Arg Asp Val Gly Ser Ala Ala Phe Lys Ile Phe Leu Lys
        1250                1255                1260
Tyr Leu Lys Lys Thr Gly Ser Lys Asn Leu Cys Ala Val Glu Leu Pro
1265                1270                1275                1280
Ser Ser Val Lys Leu Gly Phe Glu Glu Ala Gly Cys Lys Gln Ile Leu
              1285                1290                1295
Leu Glu Asn Thr Phe Ser Glu Lys Gln Phe Phe Ser Glu Val Phe Phe
              1300                1305                1310
Pro Asn Ile Gln Glu Ile Glu Ala Glu Leu Arg Asp Pro Leu Met Ile
        1315                1320                1325
Phe Val Leu Asn Glu Lys Val Asp Glu Phe Ser Gly Val Leu Arg Val
        1330                1335                1340
Thr Pro Cys Ile Pro Cys Ser Leu Glu Gly His Pro Leu Val Leu Pro
1345                1350                1355                1360
Ser Arg Leu Ile His Pro Glu Gly Arg Val Ala Lys Leu Phe Asp Ile
              1365                1370                1375
Lys Asp Gly Arg Phe Pro Tyr Gly Ser Thr Gln Asp Tyr Leu Asn Pro
        1380                1385                1390
Ile Ile Leu Ile Lys Leu Val Gln Leu Gly Met Ala Lys Asp Asp Ile
        1395                1400                1405
Leu Trp Asp Asp Met Leu Glu Arg Ala Val Ser Val Ala Glu Ile Asn
    1410                1415                1420
Lys Ser Asp His Val Ala Ala Cys Leu Arg Ser Ile Leu Leu Ser
1425                1430                1435                1440
Leu Ile Asp Glu Lys Leu Lys Ile Arg Asp Pro Arg Ala Lys Asp Phe
              1445                1450                1455
Ala Ala Lys Tyr Gln Thr Ile Arg Phe Leu Pro Phe Leu Thr Lys Pro
              1460                1465                1470
Ala Gly Phe Ser Leu Asp Trp Lys Gly Asn Ser Phe Lys Pro Glu Thr
        1475                1480                1485
Met Phe Ala Ala Thr Asp Leu Tyr Thr Ala Glu His Gln Asp Ile Val
    1490                1495                1500
Cys Leu Leu Gln Pro Ile Leu Asn Glu Asn Ser His Ser Phe Arg Gly
1505                1510                1515                1520
Cys Gly Ser Val Ser Leu Ala Val Lys Glu Phe Leu Gly Leu Leu Lys
            1525                1530                1535
Lys Pro Thr Val Asp Leu Val Ile Asn Gln Leu Lys Glu Val Ala Lys
            1540                1545                1550
Ser Val Asp Asp Gly Ile Thr Leu Tyr Gln Glu Asn Ile Thr Asn Ala
        1555                1560                1565
Cys Tyr Lys Tyr Leu His Glu Ala Leu Met Gln Asn Glu Ile Thr Lys
    1570                1575                1580
```

```
Met Ser Ile Ile Asp Lys Leu Lys Pro Phe Ser Phe Ile Leu Val Glu
1585             1590             1595             1600
Asn Ala Tyr Val Asp Ser Glu Lys Val Ser Phe His Leu Asn Phe Glu
            1605             1610             1615
Ala Ala Pro Tyr Leu Tyr Gln Leu Pro Asn Lys Tyr Lys Asn Asn Phe
        1620             1625             1630
Arg Glu Leu Phe Glu Thr Val Gly Val Arg Gln Ser Cys Thr Val Glu
        1635             1640             1645
Asp Phe Ala Leu Val Leu Glu Ser Ile Asp Gln Glu Arg Gly Thr Lys
        1650             1655             1660
Gln Ile Thr Glu Glu Asn Phe Gln Leu Cys Arg Arg Ile Ile Ser Glu
1665             1670             1675             1680
Gly Ile Trp Ser Leu Ile Arg Glu Lys Lys Gln Glu Phe Cys Glu Lys
            1685             1690             1695
Asn Tyr Gly Lys Ile Leu Leu Pro Asp Thr Asn Leu Met Leu Leu Pro
        1700             1705             1710
Ala Lys Ser Leu Cys Tyr Asn Asp Cys Pro Trp Ile Lys Val Lys Asp
        1715             1720             1725
Thr Thr Val Lys Tyr Cys His Ala Asp Ile Pro Arg Glu Val Ala Val
        1730             1735             1740
Lys Leu Gly Ala Val Pro Lys Arg His Lys Ala Leu Glu Arg Tyr Ala
1745             1750             1755             1760
Ser Asn Val Cys Phe Thr Thr Leu Gly Thr Glu Phe Gly Gln Lys Glu
            1765             1770             1775
Lys Leu Thr Ser Arg Ile Lys Ser Ile Leu Asn Ala Tyr Pro Ser Glu
        1780             1785             1790
Lys Glu Met Leu Lys Glu Leu Leu Gln Asn Ala Asp Asp Ala Lys Ala
        1795             1800             1805
Thr Glu Ile Cys Phe Val Phe Asp Pro Arg Gln His Pro Val Asp Arg
        1810             1815             1820
Ile Phe Asp Asp Lys Trp Ala Pro Leu Gln Gly Pro Ala Leu Cys Val
1825             1830             1835             1840
Tyr Asn Asn Gln Pro Phe Thr Glu Asp Asp Val Arg Gly Ile Gln Asn
            1845             1850             1855
Leu Gly Lys Gly Thr Lys Glu Gly Asn Pro Tyr Lys Thr Gly Gln Tyr
        1860             1865             1870
Gly Ile Gly Phe Asn Ser Val Tyr His Ile Thr Asp Cys Pro Ser Phe
        1875             1880             1885
Ile Ser Gly Asn Asp Ile Leu Cys Ile Phe Asp Pro His Ala Arg Tyr
        1890             1895             1900
Ala Pro Gly Ala Thr Ser Ile Ser Pro Gly Arg Met Phe Arg Asp Leu
1905             1910             1915             1920
Asp Ala Asp Phe Arg Thr Gln Phe Ser Asp Val Leu Asp Leu Tyr Leu
            1925             1930             1935
Gly Thr His Phe Lys Leu Asp Asn Cys Thr Met Phe Arg Phe Pro Leu
        1940             1945             1950
Arg Asn Ala Glu Met Ala Lys Val Ser Glu Ile Ser Ser Val Pro Ala
        1955             1960             1965
Ser Asp Arg Met Val Gln Asn Leu Leu Asp Lys Leu Arg Ser Asp Gly
        1970             1975             1980
Ala Glu Leu Leu Met Phe Leu Asn His Met Glu Lys Ile Ser Ile Cys
1985             1990             1995             2000
Glu Ile Asp Lys Ser Thr Gly Ala Leu Asn Val Leu Tyr Ser Val Lys
            2005             2010             2015
Gly Lys Ile Thr Asp Gly Asp Arg Leu Lys Arg Lys Gln Phe His Ala
        2020             2025             2030
Ser Val Ile Asp Ser Val Thr Lys Lys Arg Gln Leu Lys Asp Ile Pro
        2035             2040             2045
```

Val Gln Gln Ile Thr Tyr Thr Met Asp Thr Glu Asp Ser Glu Gly Asn
    2050   2055   2060
Leu Thr Thr Trp Leu Ile Cys Asn Arg Ser Gly Phe Ser Ser Met Glu
2065   2070   2075   2080
Lys Val Ser Lys Ser Val Ile Ser Ala His Lys Asn Gln Asp Ile Thr
       2085   2090   2095
Leu Phe Pro Arg Gly Gly Val Ala Ala Cys Ile Thr His Asn Tyr Lys
       2100   2105   2110
Lys Pro His Arg Ala Phe Cys Phe Leu Pro Leu Ser Leu Glu Thr Gly
       2115   2120   2125
Leu Pro Phe His Val Asn Gly His Phe Ala Leu Asp Ser Ala Arg Arg
       2130   2135   2140
Asn Leu Trp Arg Asp Asp Asn Gly Val Gly Val Arg Ser Asp Trp Asn
.2145   2150   2155   2160
Asn Ser Leu Met Thr Ala Leu Ile Ala Pro Ala Tyr Val Asn Cys Tyr
       2165   2170   2175
Ser Lys Asn Gly Ile Ser Leu Val Leu Ile Gln His Tyr Gln Cys Tyr
       2180   2185   2190
Arg Thr Pro Leu Phe Met Leu Arg Thr Leu Arg Ser Phe Tyr Arg Phe
       2195   2200   2205
Ser Gln Leu Thr Val Leu Ile Tyr Ser Gln Ile Tyr Ile Val Lys His
       2210   2215   2220
Phe Thr Ile Ala Phe Thr Lys Thr Asn Val Phe Tyr Leu Leu Cys Gly
2225   2230   2235   2240
Leu Gln Ile Leu Met Ala Leu Thr Cys Thr Leu Gln Leu Leu Leu Gly
       2245   2250   2255
Ser Ile Cys Leu Leu Leu Ile Lys Leu Asp His Phe Leu Thr Ile Tyr
       2260   2265   2270
Tyr Arg Met Asn Tyr Asn Thr Leu Lys Met Gln Ile Ile Ile Ser Pro
       2275   2280   2285
His Ala Lys Gln Gln Arg Met Ser Ile Gly Asn Ile Ser Phe Lys Leu
       2290   2295   2300
Val Ser Thr Trp Phe Ile Thr Val Met Lys Leu Leu Ile Phe Thr Thr
2305   2310   2315   2320
Val Leu Met Gln Ile Phe Leu Leu Val Met Pro Leu Leu Ile Ser Asp
       2325   2330   2335
Leu Phe His Phe Pro Leu Leu Thr Leu Ile Ala Ile Leu Gly Ser Cys
       2340   2345   2350
Leu Val Val Cys Ser Arg Leu Ile Asn Phe Phe Ile Val Asn Phe Leu
       2355   2360   2365
Ile Ile Val Leu Lys Met Gln Lys Lys Met Arg Leu Lys Leu Arg Asp
       2370   2375   2380
Cys Pro Phe Ser Ser His Trp Thr Val Phe Cys Lys Leu Leu Met Gln
2385   2390   2395   2400
Asn Asp Pro Ser Phe Gln His Ile Met Asn Phe His Pro Ala Lys Thr
       2405   2410   2415
Cys Leu Ile His Tyr Ile Asn Ile Val Ile Phe Tyr Thr Val Lys Leu
       2420   2425   2430
Gln Lys Cys Leu Thr Phe Pro Ala Leu Leu Ile Cys Tyr Pro Leu Cys
       2435   2440   2445
Cys Leu Glu Asn Ile Arg Pro Lys Val Ala Gln Ser Gly Lys Thr Ile
       2450   2455   2460
Leu Gln Val Ser Leu Gly Leu Arg Met His Gly Ile Leu Leu Val Asn
2465   2470   2475   2480
Leu Val Lys Lys Ile Arg Lys Lys Gln Asn Gln His Leu Thr Leu Leu
       2485   2490   2495
Leu Ile Leu Lys Thr Gly His Cys Phe Gln Glu Gln Ser Leu Leu Phe
       2500   2505   2510

```
Gln Pro Thr Ser Leu Trp Phe Leu Lys Glu Met Phe Cys Phe Leu Ser
        2515            2520            2525
Ala Leu Cys Thr Leu Gln Phe Phe Gln Met Pro Arg Val Ile Lys Phe
        2530            2535            2540
Phe Met Leu Lys Pro Ala Val Phe Ser Leu Leu Thr Lys Ser Val Pro
2545            2550            2555            2560
Lys Thr Val His Leu Phe Leu Cys Cys His Val Thr Gln Gln Ile Arg
            2565            2570            2575
Ala Pro Gln Ala Ser Arg Leu Tyr Ile Ile Trp Ser Lys Leu Gln His
        2580            2585            2590
Leu Glu Gln Lys Asn Lys Met Ile Leu Arg His Phe Cys Ile Ser Thr
        2595            2600            2605
Ala Ile Ile Ile Cys Pro Lys Met Ile Lys Phe Ser His Phe Arg Ala
        2610            2615            2620
Ile Asn Pro Ser Val Ala Ala Met Ala Leu Glu Asn Leu Glu His Ala
2625            2630            2635            2640
Thr Tyr Leu Gln Lys Val Ser Leu Gln Leu Lys Trp Arg Asn Gly His
            2645            2650            2655
Asn His His His Leu His Phe Leu Lys Lys Lys Tyr Thr Lys Asn Tyr
            2660            2665            2670
Met Arg Leu Val Val Tyr Leu Met Ile Leu Arg Tyr Ile Asn Thr Ser
            2675            2680            2685
Tyr Gln Lys Leu Lys Ile Ser Leu Met Met Gln Asn Ser Thr Ser Thr
        2690            2695            2700
Leu Arg Ile Asp Tyr Gln Val Leu Arg Asn Tyr Gln Arg Leu Arg Asn
2705            2710            2715            2720
Asn Phe Leu Lys Asn Trp Lys Val Tyr Ser Met Met Leu Thr Val Asp
            2725            2730            2735
Ser Lys Gln Ser Ile Ser Met Ile Glu Leu Glu Phe Leu Lys Leu Cys
            2740            2745            2750
Phe Leu Lys Asn Cys Leu Phe Leu Met Ile Ser Leu Arg Asn Trp Asn
            2755            2760            2765
Asn Leu Asn Pro Lys Ile Met Leu His Leu His Pro Gly Trp Asn Ser
        2770            2775            2780
Glu Ile Leu Asp Asn Thr Tyr Phe Leu Ser Ser Ser Cys Tyr Ser Leu
2785            2790            2795            2800
Leu Arg Lys Ser Val Gly Leu Ile Gln Lys Thr Gly Pro Lys Lys His
            2805            2810            2815
Cys Lys Ile Gln Leu Ile Ser Phe Cys Ile Ile Tyr Ser Lys Asn Glu
        2820            2825            2830
Trp Ile Cys Tyr Leu Glu Ile Phe Lys Asn Tyr Leu Tyr His Ser Tyr
        2835            2840            2845
Val Leu Ser Gly Pro Pro Arg Asn Ser Leu Asp Phe Ile Leu Asn Ile
        2850            2855            2860
Lys Arg Met Glu His Phe Leu Leu Ser Ser Met Glu His Arg Ile Gln
2865            2870            2875            2880
Asn Ser Ser Asn Val Met Tyr Ser Ser Cys Tyr Gly His Pro Ala Leu
            2885            2890            2895
Phe Phe Gln Arg Lys Leu His Pro Ala Leu Lys Asn Lys Lys Val Val
            2900            2905            2910
Thr Leu Val His Lys Asn Ser Leu Asn Lys Phe Ile Cys Leu Met Leu
            2915            2920            2925
Thr Trp Ile Leu Leu Leu Ile Arg Ser Ile Thr Ala Glu Thr Tyr Ala
        2930            2935            2940
Thr Arg Arg Trp Met Lys Lys Trp Lys Leu Glu Gln Lys Ser Gly Ala
2945            2950            2955            2960
Tyr Met Asn Ser Ser Val Gln Lys Lys Gly Asn Phe Val Phe Ser Cys
            2965            2970            2975
```

```
Glu Gly Leu Leu Leu Trp Lys Met Val Gly Asn Phe Ser Leu Arg Arg
          2980              2985              2990
Ser Thr Asn Met Asn Leu Ile Leu Asn Leu Ile Cys Thr Ser Tyr Leu
          2995              3000              3005
Asn Leu Ala His Phe Thr Ser Cys Ser Asn Thr Val Leu Lys Ile Leu
     3010              3015              3020
Phe Gln Leu Ser Asn Met Leu Lys Cys Ala Ala Tyr Leu Lys Ile Leu
3025              3030              3035              3040
Arg Ala Asn Asn Ile Leu Met Lys Cys Val Gln Leu Arg Glu Phe Leu
          3045              3050              3055
Val Cys Ser Gly Val Tyr Arg Met Ile Gln Ser Arg Gly Val Ile Ser
          3060              3065              3070
Arg Met Tyr Glu Thr Leu Arg Phe Thr Ser Gln Ala Arg Met Val Asp
          3075              3080              3085
Trp Ser Gln Ala Ser Cys Leu Thr Met Arg His Ile Ile Lys Val Glu
          3090              3095              3100
Ser Arg Gly Ile Leu Val Cys Lys Cys Leu Ile Ser Ala Ser Ala Thr
3105              3110              3115              3120
Gly Lys Thr Met Asp Phe Thr Leu Ser Cys Ser Phe Leu Lys Asn Leu
          3125              3130              3135
Asp Leu Asp Tyr Ala Val Tyr Leu Lys Asn Asn Met Lys Arg Leu Pro
          3140              3145              3150
Lys Phe Val Ser Leu Glu Arg Cys Val Leu Phe Lys Glu Asp Cys Ser
          3155              3160              3165
Tyr Ser Cys Leu Leu Asn Ser Ser Leu Gln Asp Leu Glu Leu Ser Met
          3170              3175              3180
Lys Met Ile Met Leu Phe Trp Pro Met Lys Lys Lys Pro Asp Phe Ala
3185              3190              3195              3200
Lys Pro Glu Lys Asp Lys Tyr Pro Ala Leu Lys Ser Phe Lys Gln His
          3205              3210              3215
Glu Leu Lys Val Leu Ile Leu Phe Pro Thr Ala Glu Val Lys Leu Leu
          3220              3225              3230
Leu Phe Ser Asp Leu Val Met Gln Ser Ser Cys Ser Thr Phe Asn Ile
          3235              3240              3245
Gln Thr Val Lys Thr Leu Ile Ser Cys His Trp Gln Leu Leu Asn Gln
3250              3255              3260
Gln Leu Thr Ile Phe Leu Thr Leu His Ile Leu Leu Cys Asp Ala Met
3265              3270              3275              3280
Ile Phe Thr Gly Leu Val Arg Asn Leu Thr Val Glu Asn Met Thr Leu
          3285              3290              3295
Arg Ser His Gln Asn Trp Asn Phe Gln Cys Leu Ala His Gln Phe Leu
          3300              3305              3310
Leu Lys Phe Ile Thr Leu Cys Leu Trp Thr Gln Met Phe Phe Thr Arg
          3315              3320              3325
Glu Asn Met Leu Gly Thr Leu Leu Met Leu Lys Val Val Ile Ser Met
          3330              3335              3340
Asp His Thr Ser Gln His Thr His Met Gln Leu Leu Tyr Lys Lys Leu
3345              3350              3355              3360
Lys Glu Lys Met Leu Thr Ile Leu Val Phe Glu Arg Tyr Ile Arg Ile
          3365              3370              3375
Leu Val Ile Val Asn Ile Lys Leu Ala Leu Leu Ile Cys Ile Ser Phe
          3380              3385              3390
Gln Asp Leu Arg Lys Ala Leu Lys Ala Gly Thr Val Leu Leu Leu His
          3395              3400              3405
Gln Pro Ala Pro Leu Ser Ser Ser Pro Leu Ala Glu Ala Phe Leu Leu
          3410              3415              3420
Phe Ser Leu Val Glu Arg Ala Thr Arg Leu Leu Pro Asn Ile Ser Pro
3425              3430              3435              3440
```

Pro Lys Ser Leu Arg Leu Ile Leu Tyr Gln Lys Ser Lys Lys His Leu
                3445   3450   3455
Trp Trp Ser Lys His Gly Ser Phe Gln Asn Arg Asn Glu Lys Arg Leu
                3460   3465   3470
Leu Gly Gly Cys Ile Asn Gly Ile Leu Thr Lys Ile Gln Arg Thr Met
            3475   3480   3485
Thr Leu Pro Met Lys Phe Leu Asn Ile Cys Arg Met Lys Ser Thr Asp
        3490   3495   3500
Lys Asn Arg Leu Phe Ile Lys Met Gln Thr Gly Pro Pro Asp Glu His
3505   3510   3515   3520
Phe Gln Pro Gln His Pro Asp Phe Ser Gln Thr Asn Thr His Phe Arg
                3525   3530   3535
Asp Ser Ile Leu His Gly Ile Lys Lys Gln Arg Ala Ile Asn Leu Lys
            3540   3545   3550
Asp Ser Asn Arg Thr Lys Lys Asn Ala Pro Leu Gln Pro Asp Arg Leu
            3555   3560   3565
Thr Leu Lys Gly Ser Leu Phe Leu Pro Leu Ser Ser Arg Leu Ala Ile
        3570   3575   3580
Gln Trp Lys His Ala Asp Gly Asp Lys Pro Glu Gln Thr Ser Gln Leu
3585   3590   3595   3600
Pro Gly Met Thr Phe Ile Lys Met Pro Met Ser Gly Cys Ala Leu Asn
                3605   3610   3615
Val Thr Phe Leu Pro Ser Leu Leu Gln Leu Thr Met Leu Gly Glu Ser
            3620   3625   3630
Leu Ile Lys Met Asn Gln Leu His Leu Leu Arg Lys Arg Asn Ile Val
        3635   3640   3645
Ser Asn Leu Lys Asp Gln Met Met Phe Thr His Trp Lys Leu Met Val
        3650   3655   3660
Thr Val Lys Gln Asp Thr Leu Ile Cys Phe Pro Phe Leu Arg Ser Gln
3665   3670   3675   3680
Met Thr Gly Ser Leu Leu Arg Leu Leu Gly Trp Asn Val Leu Pro Val
            3685   3690   3695
Ser Asn Leu Lys Ile Leu Cys Asn Lys Lys Cys
            3700   3705

<210> 9
<211> 12717
<212> DNA
<213> Homo sapiens

<400> 9
atgaatacat tctggcctgg cagagaattg attgttcaat ggtatccatt tgatgaaaac 60
agaaatcacc catctgtttc atggcttaag atggtttgga aaaatcttta tatacatttt 120
tcagaggatt tgactttatt tgatgagatg ccacttatcc ccagaactat actagaggaa 180
ggtcagacat gtgtggaact cattagactc aggattccat cgttagtcat tttagacgat 240
gaatctgaag cacagcttcc agaatttta gcagacattg tacaaaaact tggagggttt 300
gtccttaaaa aattagatgc atctatacaa catccgctta ttaaaaaata tattcattca 360
ccattaccaa gtgctgtttt gcagataatg gagaagatgc cattgcagaa attgtgtaat 420
caaataactt cgctacttcc aacacacaaa gatgccctga ggaagttctt ggctagttta 480
accgatagca gtgagaaaga gaaaagaatt attcaagaat ggcaatatt caagcgcatt 540
aaccattctt ctgatcaggg aatttcctct tatacaaaat gaaaggttg taaagtctta 600
caccatactg ccaaactccc agcagatctg cgactttcta tttcagtaat agacagtagt 660
gatgaagcta ctattcgtct ggcaaacatg ttgaaaatag aacagttaaa gaccactagc 720
tgcttaaagc ttgtttaaa agatattgaa aatgcatttt attcacatga gaggtaaca 780
cagcttatgt tatgggtcct tgagaatcta tcttctctta aaaatgagaa tccaaatgtg 840
cttgagtggt taacaccatt aaaattcatc cagatatcac aggaacagat ggtatcagct 900
ggtgaactct ttgaccctga tatagaagta ctaaaggatc tcttttgtaa tgaagaagga 960

```
acctatttcc caccctcagt ttttacctca ccagatattc ttcactcctt aagacagatt 1020
ggtttaaaaa acgaagccag tctcaaagaa aaggatgttg tgcaagtggc aaaaaaaatt 1080
gaagccttac aggtcggtgc ttgtcctgat caagatgttc ttctgaagaa agccaaaacc 1140
ctcttactgg ttttaaataa gaatcacaca ctgttgcaat catctgaagg aaagatgaca 1200
ttgaagaaaa taaaatgggt tccagcctgc aaggaaaggc ctccaaatta tccaggctct 1260
ttggtctgga aaggagatct ctgtaatctc tgtgcaccac cagatatgtg tgatgtaggc 1320
catgcaattc tcattggctc ctcacttcct cttgttgaaa gtatccatgt aaacctggaa 1380
aaagcattag ggatcttcac aaaaacctagc cttagtgctg tcttaaaaca cttttaaaatt 1440
gttgttgatt ggtattcttc aaaaaccttt agtgatgaag actactatca attccagcat 1500
attttgcttg agatttacgg attcatgcat gatcatctaa atgaagggaa agattctttt 1560
agagccttaa aatttccatg ggtttggact ggcaaaaagt tttgtccact tgcccaggct 1620
gtgattaaac caatccatga tcttgacctt cagccttatt tgcataatgt acctaaaacc 1680
atggcaaaat tccaccaact atttaaggtc tgtggttcaa tagaggagtt gacatcagat 1740
catatttcca tggttattca gaagatatat ctcaaaagtg accaagatct cagtgaacaa 1800
gaaagcaaac aaaatcttca tcttatgttg aatattatca gatggctgta tagcaatcag 1860
attccagcaa gccccaacac accagttcct atacatcata gcaaaaatcc ttctaaactt 1920
atcatgaagc caattcacga atgctgttat tgtgacatta aagttgatga ccttaatgac 1980
ttacttgaag attctgtgga accaatcatt ttggtgcatg aggacatacc catgaaaact 2040
gcagaatggc taaaagttcc atgccttagt acaagactga taaatcctga aaacatggga 2100
tttgagcagt caggacaaag agagccactt actgtaagaa ttaaaaatat tctggaagaa 2160
taccctccag tgtcagatat ttttaaagaa ctacttcaaa acgctgatga tgcaaatgca 2220
acagaatgca gtttcttgat tgatatgaga agaaatatgg acataagaga gaatctccta 2280
gacccaggga tggcagcttg tcatggacct gctttgtggt cattcaacaa ttctcaattc 2340
tcagattcag attttgtgaa cataactagg ttaggagaat cttttaaaaag gggagaagtt 2400
gacaaagttg gaaaatttgg tcttggattt aattctgtgt accatatcac tgacattccc 2460
atcattatga gtcgggaatt catgataatg ttcgatccaa acataaatca tatcagtaaa 2520
cacattaaag acaaatccaa tcctgggatc aaaattaatt ggagtaaaca acagaaaaga 2580
cttagaaaat ttcctaatca gttcaaacca tttatagatg tatttggctg tcagttacct 2640
ttgactgtag aagcacctta cagctataat ggaacccttt tccgactgtc ctttagaact 2700
caacaggaag caaaagtgag tgaagttagt agtacgtgct acaatacagc agatatttat 2760
tctcttgtgg atgaatttag tctctgtgga cacaggctta tcattttcac tcagagtgta 2820
aagtcaatgt atttgaagta cttgaaaatt gaggaaacca accccagttt agcacaagat 2880
acagtaataa ttaaaaaaaa atcctgctct tccaaagcat tgaacacacc tgtcttaagt 2940
gttttaaaag aggctgctaa gctcatgaag acttgcagca gcagtaataa aaagcttccc 3000
agtgatgaac caaagtcatc ttgcattctt cagatcacag tggaagaatt tcaccatgtg 3060
ttcagaagga ttgctgattt acagtcgcca cttttttagag gtccagatga tgacccagct 3120
gctctctttg aaatggctaa gtctggccaa tcaaaaaagc catcagatga gttgtcacag 3180
aaaacagtag agtgtaccac gtggcttctg tgtacttgca tggacacagg agaggctctg 3240
aagttttccc tgagtgagag tggaagaaga ctaggactgg ttccatgtgg ggcagtagga 3300
gttcagctgt cagaaatcca ggaccagaag tggacagtga aaccacacat tggagaggtg 3360
ttttgctatt tacctttacg aataaaaaca ggcttgccag ttcatatcaa tgggtgcttt 3420
gctgttacat caaataggaa agaaatctgg aaaacagata caaaaggacg atggaatacc 3480
acgttcatga gacatgttat tgtgaaagct tacttacagg tactgagtgt cttacgggac 3540
ctggccacta gtggggagct aatggattat acttactatg cagtatggcc cgatcctgat 3600
ttagttcatg atgatttttc tgtaatttgc caaggatttt atgaagatat agctcatgga 3660
aaagggaaag aactgaccaa agtcttctct gatggatcta cttgggtttc catgaagaac 3720
gtaagatttc tagatgactc tatacttaaa agaagagatg ttggttcagc agccttcaag 3780
atattttga aatacctcaa gaagactggg tccaaaaacc tttgtgctgt tgaacttcct 3840
tcttcggtaa aattaggatt tgaagaagct ggctgcaaac agatactact tgaaaacaca 3900
ttttcagaga aacagttttt ttctgaagtg tttttttccaa atattcaaga aattgaagca 3960
gaacttagag atcctttaat gatctttgtt ctaaatgaaa aagttgatga gttctcggga 4020
gttcttcgtg ttactccatg tattccttgt tccttggagg ggcatccttt ggttttgcca 4080
tcaagattga tccaccccga aggacgagtt gcaaagttat ttgatattaa agatgggaga 4140
ttcccttatg gttctactca ggattatctc aatcctatta ttttgattaa actagttcag 4200
ttaggtatgg caaaagatga tattttatgg gatgatatgc tagaacgtgc agtgtcagta 4260
gctgaaatta ataaaagtga tcatgttgct gcatgcctaa gaagtagtat cttattgagt 4320
cttatcgatg agaaactaaa aataagggat cctagagcaa aggattttgc tgcaaaatat 4380
caaacaatcc gcttccttcc atttctgaca aaaccagcag gttttttcttt ggactggaaa 4440
```

```
ggcaacagtt ttaagcctga aaccatgttt gcagcaactg acctttatac agctgaacat 4500
caagatatag tttgtctttt gcaaccaatt ctaaatgaaa attcccattc ttttagaggt 4560
tgtggttcag tgtcattggc tgttaaagag ttttttgggat tactcaagaa gccaacagtt 4620
gatctggtta taaaccaatt gaaagaagta gcaaaatcag ttgatgatgg aattacactg 4680
taccaggaga atatcaccaa tgcttgctac aaataccttc atgaagcctt gatgcaaaat 4740
gaaatcacta agatgtcaat tattgataag ttaaaacctt ttagcttcat tctagttgag 4800
aatgcatatg ttgactcaga aaaggtttct tttcatttaa attttgaggc ggcaccatac 4860
ctttatcagt tgcctaataa gtataaaaat aatttccgcg aacttttga aaccgtgggt 4920
gtgaggcagt catgcactgt tgaagatttt gctcttgttt tggaatctat tgatcaagaa 4980
agaggaacaa agcaaataac agaagagaat tttcagcttt gccgacgaat aatcagtgaa 5040
ggaatatgga gtctcattag agaaaagaaa caagaatttt gtgagaaaaa ttatggcaag 5100
atattattgc cagatactaa tcttatgctt ctccctgcta aatcgttatg ctacaatgat 5160
tgcccttgga taaaagtaaa ggataccact gtaaaatatt gtcatgctga catacccagg 5220
gaagtagcag taaaactagg agcagtccca aagtgacaca aagccttaga aagatatgca 5280
tccaatgtct gtttttacaac acttggcaca gaatttgggc agaaagaaaa attgaccagc 5340
agaattaaga gcatccttaa tgcatatcct tctgaaaagg aaatgttgaa agagcttctt 5400
caaaatgctg atgatgcaaa ggcgacagaa atctgttttg tgtttgatcc tagacagcat 5460
ccagttgata gaatatttga tgataagtgg gccccattgc aagggccagc actttgtgtg 5520
tacaacaacc agccatttac agaagatgat gttagaggaa ttcagaatct tggaaaaggc 5580
acgaaagagg gaaatcctta taaaactgga cagtatggaa taggattcaa ttctgtgtat 5640
catatcacag actgcccatc tttatttct ggcaatgaca tcctgtgtat ttttgatcct 5700
catgccagat atgcaccagg ggccacatcc attagtcccg gacgcatgtt tagagatttg 5760
gatgcagatt ttaggacaca gttctcagat gttctggatc tttatctggg aacccatttt 5820
aaactggata attgcacaat gttcagattt cctcttcgta atgcagaaat ggcaaaagtt 5880
tcggaaattt cgtctgttcc agcatcagac agaatggtcc agaatctttt ggacaaactg 5940
cgctcagatg gggcagaact tctaatgtt cttaatcaca tggaaaaaat ttctatttgt 6000
gaaatagata agagtactgg agctctaaat gtgctgtatt cagtaaaggg caaaatcaca 6060
gatggagaca gattgaaaag gaaacaattt catgcatctg taattgatag tgttactaaa 6120
aagaggcagc tcaaagacat accagttcaa caaataacct atactatgga tactgaggac 6180
tctgaaggaa atcttactac gtggctaatt tgtaatagat caggcttttc aagtatggag 6240
aaagtatcta aaagtgtcat atcagctcac aagaaccaag atattactct tttcccacgt 6300
ggtggagtag ctgcctgcat tactcacaac tataaaaaac cccatagggc cttctgtttt 6360
ttgcctcttt ctttggagac tgggctgcca tttcatgtga atggccactt tgcactggat 6420
tcagccagaa ggaacctgtg gcgtgatgat aatggagttg gtgttcgaag tgactggaat 6480
aacagtttaa tgacagcatt aatagctcct gcatatgttg aattgctaat acagttaaaa 6540
aaacggtatt ccctggttc tgatccaaca ttatcagtgt tacagaacac ccctattcat 6600
gttgtaaagg acactttaaa gaagtttta tcgttttcc cagttaaccg tcttgatcta 6660
cagccagatt tatattgtct agtgaaagca ctttacaatt gcattcacga agacatgaaa 6720
cgtctttac ctgttgtgcg ggctccaaat attgatggct ctgacttgca ctctgcagtt 6780
ataattactt ggatcaatat gtctacttct aataaaacta gaccatttt tgacaattta 6840
ctacaggatg aattacaaca ccttaaaaat gcagattata atatcaccac acgcaaaaca 6900
gtagcagaga atgtctatag gctgaaacat ctcctttttag aaattggttt caacttggtt 6960
tataactgtg atgaaactgc taatctttac cactgtctta tagatgcaga tattcctgtt 7020
agttatgtga cccctgctga tatcagatct tttttaatga catttttcctc tcctgacact 7080
aattgccata ttgggaagct gccttgtcgt ctgcagcaga ctaatctaaa acttttcat 7140
agtttaaaac ttttagttga ttattgtttt aaagatgcag aagaaatga gattgaagtt 7200
gagggattgc cccttctcat cacactggac agtgttttgc aaacttttga tgcaaaacga 7260
cccaagtttc taacaacata tcatgaattg attccatccc gcaaagactt gtttatgaat 7320
acattatatt tgaaatatag taatatttta ttgaactgta aagttgcaaa agtgtttgac 7380
atttccagct ttgctgattt gttatcctct gtgttgcctc gagaatataa gaccaaaagt 7440
tgcacaaagt ggaaagacaa tttttgcaagt gagtcttggc ttaagaatgc atggcattt 7500
attagtgaat ctgtaagtgt gaaagaagat caggaagaaa caaaaccaac atttgacatt 7560
gttgttgata ctctaaaaga ctgggcattg cttccaggaa caaagtttac tgtttcagcc 7620
aaccagcttg tggttcctga aggagatgtt ctgcttcctc tcagccttat gcacattgca 7680
gtttttccaa atgcccagag tgataaagtt tttcatgctc taatgaaagc cggctgtatt 7740
cagcttgctt tgaacaaaat ctgttccaaa gacagtgcat ttgttccttt gttgtcatgt 7800
cacacagcaa atatagagag ccccacaagc atcttgaagg ctctacatta tatggtccaa 7860
acttcaacat ttagagcaga aaaattagta gaaaatgatt ttgaggcact tttgatgtat 7920
```

```
ttcaactgca atttgaatca tttgatgtcc caagatgata taaaaattct aaagtcactt 7980
ccgtgctata aatccatcag tggccgctat gtaagcattg gaaaatttgg aacatgctac 8040
gtacttacaa aaagtatccc ttcagctgaa gtggagaaat ggacacaatc atcatcatct 8100
gcatttcttg aagaaaaaat acacttaaaa gaactatatg aggtgattgg ttgtgtacct 8160
gtagatgatc ttgaggtata tttgaaacac ctcttaccaa aaattgaaaa tctctcttat 8220
gatgcaaaat tagagcactt gatctacctt aagaatagat tatcaagtgc tgaggaatta 8280
tcagagatta aggaacaact ttttgaaaaa ctggaaagtt tattgataat ccatgatgct 8340
aacagtagac taaagcaagc aaagcatttc tatgatagaa ctgtgagagt ttttgaagtt 8400
atgcttcctg aaaaattgtt tattcctaat gatttcttta agaaattgga acaacttata 8460
aaacccaaaa atcatgttac atttatgaca tcctgggtgg aattcttaag aaatattgga 8520
ctaaaataca tactttctca gcagcagttg ttacagtttg ctaaggaaat cagtgtgagg 8580
gctaatacag aaaactggtc caaagaaaca ttgcaaaata cagttgatat ccttctgcat 8640
catatattcc aagaacgaat ggatttgtta tctggaaatt ttctgaaaga actatcttta 8700
ataccattct tatgtcctga gcgggccccc gcggaattca ttagatttca tcctcaatat 8760
caagaggtaa atggaacact tcctcttata aagttcaatg gagcacaggt aaatccaaaa 8820
ttcaagcaat gtgatgtact ccagctgtta tggacatcct gccctattct tccagagaaa 8880
gctacaccct taagcattaa agaacaagaa ggtagtgacc ttggtccaca agaacagctt 8940
gaacaagttt taaatatgct taatgttaac ctggatcctc ctcttgataa ggtaatcaat 9000
aactgcagaa acatatgcaa cataacgacg ttggatgaag aaatggtaaa aactagagca 9060
aaagtcttaa ggagcatata tgaattcctc agtgcagaaa aaagggaatt tcgttttcag 9120
ttgcgagggg ttgcttttgt gatggtagaa gatggttgga aacttctgaa gcctgaggag 9180
gtagtcataa acctagaata tgaatctgat tttaaacctt atttgtacaa gctaccttta 9240
gaacttggca catttcacca gttgttcaaa cacttaggta ctgaagatat tatttcaact 9300
aagcaatatg ttgaagtgtt gagccgcata tttaaaaatt ctgagggcaa acaattagat 9360
cctaatgaaa tgcgtacagt taagagagta gtttctggtc tgttcaggag tctacagaat 9420
gattcagtca aggtgaggag tgatctcgag aatgtacgag accttgcgct ttacctccca 9480
agccaggatg gtagattggt aaagtcaagc atcttagtgt ttgacgatgc gccacattat 9540
aaaagtagaa tccaggggaa tattggtgtg caaatgttag ttgatctcag ccagtgctac 9600
ttagggaaag accatggatt tcacactaag ttgataatgc tctttcctca aaaacttaga 9660
cctcgattat tgagcagtat acttgaagaa caattagatg aagagactcc caaagtttgt 9720
cagtttggag cgttgtgttc tcttcaagga agattgcagt tactcttgtc ttctgaacag 9780
ttcattacag gactgattag aattatgaag catgaaaatg ataatgcttt tctggccaat 9840
gaagaaaaag ccataagact ttgcaaagcc ctaagagaag gattgaaagt atcctgcttt 9900
gaaaagcttc aaacaacatt aagagttaaa ggttttaatc ctattcccca cagcagaagt 9960
gaaacttttg ctttttgaa gcgatttggt aatgcagtca tcttgctcta cattcaacat 10020
tcagacagta aagacattaa tttcctgtta gcactggcaa tgactcttaa atcagcaact 10080
gacaatttga tttctgacac ttcatattta attgctatgc taggatgcaa tgatatttac 10140
aggattggtg agaaacttga cagtttagga gtgaaatatg actcttcgga gccatcaaaa 10200
ctggaacttc caatgcctgg cacaccaatt cctgctgaaa ttcattacac tctgcttatg 10260
gacccaatga atgttttta cccgggagaa tatgttgggt accttgttga tgctgaaggt 10320
ggtgatatct atggatcata ccagccaaca tacacatatg caattattgt acaagaagtt 10380
gaaagagaag atgctgacaa ttctagtttt ctaggaaaga tatatcagat agatattggt 10440
tatagtgaat ataaaatagt tagctctctt gatctgtata agttttcaag acctgaggaa 10500
agctctcaaa gcagggacag tgctccttct acaccaacca gccccactga gttcctcacc 10560
cctggcctga gaagcattcc tcctcttttc tctggtagag agagccacaa gacttcttcc 10620
aaacatcagt cccccaaaaa gcttaaggtt aattctttac cagaaatctt aaaagaagtg 10680
acatctgtgg tggagcaagc atggaagctt ccagaatcgg aacgaaaaaa gattattagg 10740
cggttgtatt tgaaatggca tcctgacaaa aatccagaga accatgacat tgccaatgaa 10800
gtttttaaac atttgcagaa tgaaatcaac agattagaaa aacaggcttt tctagatcaa 10860
aatgcagaca gggcctccag acgaacattt tcaacctcag catcccgatt tcagtcagac 10920
aaatactcat ttcagagatt ctatacttca tggaatcaag aagcaacgag ccataaatct 10980
gaaagacagc aacagaacaa agaaaaatgc cccccttcag ccggacagac ttactctcaa 11040
aggttctttg ttcctcccac tttcaagtcg gttggcaatc cagtggaagc acgcagatgg 11100
ctaagacaag ccagagcaaa cttctcagct gccaggaatg accttcataa aaatgccaat 11160
gagtgggtgt gctttaaatg ttacctttct accaagttag ctttgattgc agctgactat 11220
gctgtgaggg gaaagtctga taaagatgta aaaccaactg cacttgctca gaaaatagag 11280
gaatatagtc agcaacttga aggactgaca aatgatgttc acacattgga agcttatggt 11340
gtagacagtt taaaaacaag ataccctgat ttgcttccct tcctcagat cccaaatgac 11400
```

```
aggttcactt ctgaggttgc tatgagggtg atggaatgta ctgcctgtat cataataaaa 11460
cttgaaaatt ttatgcaaca aaaagtgtga agatatttaa cgaaaaaaaa ggtagatctt 11520
gaatgtgttg tagcacgaat aaattgctgt acttcattaa gcttcattgc caattagcta 11580
ggaattgtta agcacattgc agattgttct tggagaattc tggagttgtt atgaacatga 11640
ataccaacgg aaaaccttaa ctgaatctaa aagaaaacta ttttgaagat ggtggtgagc 11700
tgcaaaatag ctggatggat ttgaatgatt gggatgatac atcattgaac tgcactttat 11760
ataaccaaag cttagcagtt tgttagataa gagtctatgt atgtctctgg ttaggatgaa 11820
gttaatttta tgtttttaac atggtatttt tgaaggagct aatgaaacac tggacatata 11880
attggtttaa acataagggg aattaagtct ttgtagtctg tcattttttt aagtggatcc 11940
tcttggatgc gttattttct catcagctgg ctctgatcat gaatttgttg taattttatg 12000
ttgtactcag tgcatttaag aaatggtaga gtattttaat cctattactt gactaagagt 12060
gtgaaggtag tacttttag agtgcactga gtgcacttta catctttatt taaattttt 12120
tttaacatct tatgtttaca ggcttcctgt ttgatgaaga tagcaacgga aaactcaaaa 12180
tggtggcagt tcttattacc agttgttagt attgttctg gaaactgctt gccaagacaa 12240
catttattaa ctgttagaac acttgcttta tgtttgtgtg tacatatttt ccacaaatgt 12300
tataatttat atagtgtggt tgaacaggat gcaatctttt gttgtctaaa ggtgctgcag 12360
ttaaaaaaaa aacaaccttt tctttcaata tggcatgtag tggagttttt ttaactttaa 12420
aaacatcaaa aattgttaaa atcattgtgt tatctagtag tttataatta tcggcttata 12480
tttccccatg aatgatcaga actgacattt aattcatgtt tgtctcgcca tgcttcttta 12540
ctttaacata tttcttttgc agaatgtaaa aggtaatgat aattagttta tataagtgta 12600
ctggctgtaa atgatgctaa atatacttta tgcaattaag ggcttacaga acatgttgaa 12660
acttttttta cttttattgg gaataaggaa tgtttgcacc tccacatttt attgctt    12717
```

```
<210> 10
<211> 3559
<212> PRT
<213> Homo sapiens

<400> 10
Phe His Gly Leu Arg Trp Phe Gly Lys Ile Phe Ile Tyr Ile Phe Gln
1               5                   10                  15
Arg Ile Leu Tyr Leu Met Arg Cys His Leu Ser Pro Glu Leu Tyr Arg
            20                  25                  30
Lys Val Arg His Val Trp Asn Ser Leu Asp Ser Gly Phe His Arg Ser
        35                  40                  45
Phe Thr Met Asn Leu Lys His Ser Phe Gln Asn Phe Gln Thr Leu Tyr
    50                  55                  60
Lys Asn Leu Glu Gly Leu Ser Leu Lys Asn Met His Leu Tyr Asn Ile
65                  70                  75                  80
Arg Leu Leu Lys Asn Ile Phe Ile His His Tyr Gln Val Leu Phe Cys
                85                  90                  95
Arg Trp Arg Arg Cys His Cys Arg Asn Cys Val Ile Lys Leu Arg Tyr
            100                 105                 110
Phe Gln His Thr Lys Met Pro Gly Ser Ser Trp Leu Val Pro Ile Ala
        115                 120                 125
Val Arg Lys Arg Lys Glu Leu Phe Lys Asn Trp Gln Tyr Ser Ser Ala
    130                 135                 140
Leu Thr Ile Leu Leu Ile Arg Glu Phe Pro Leu Ile Gln Asn Lys Val
145                 150                 155                 160
Val Lys Ser Tyr Thr Ile Leu Pro Asn Ser Gln Gln Ile Cys Asp Phe
                165                 170                 175
Leu Phe Gln Thr Val Val Met Lys Leu Leu Phe Val Trp Gln Thr Cys
            180                 185                 190
Lys Asn Ser Arg Pro Leu Ala Ala Ser Leu Phe Lys Ile Leu Lys Met
            195                 200                 205
```

```
His Phe Ile His Met Lys Arg His Ser Leu Cys Tyr Gly Ser Leu Arg
    210                 215                 220
Ile Tyr Leu Leu Leu Lys Met Arg Ile Gln Met Cys Leu Ser Gly His
225                 230                 235                 240
His Asn Ser Ser Arg Tyr His Arg Asn Arg Trp Tyr Gln Leu Val Asn
                245                 250                 255
Ser Leu Thr Leu Ile Lys Tyr Arg Ile Ser Phe Val Met Lys Lys Glu
                260                 265                 270
Pro Ile Ser His Pro Gln Phe Leu Pro His Gln Ile Phe Phe Thr Pro
                275                 280                 285
Asp Arg Leu Val Lys Thr Lys Pro Val Ser Lys Lys Arg Met Leu Cys
    290                 295                 300
Lys Trp Gln Lys Lys Leu Lys Pro Tyr Arg Ser Val Leu Val Leu Ile
305                 310                 315                 320
Lys Met Phe Phe Arg Lys Pro Lys Pro Ser Tyr Trp Phe Ile Arg Ile
                325                 330                 335
Thr His Cys Cys Asn His Leu Lys Glu Arg His Arg Lys Asn Gly Phe
                340                 345                 350
Gln Pro Ala Arg Lys Gly Leu Gln Ile Ile Gln Ala Leu Trp Ser Gly
                355                 360                 365
Lys Glu Ile Ser Val Ile Ser Val His His Gln Ile Cys Val Met Ala
    370                 375                 380
Met Gln Phe Ser Leu Ala Pro His Phe Leu Leu Leu Lys Val Ser Met
385                 390                 395                 400
Thr Trp Lys Lys His Gly Ser Ser Gln Asn Leu Ala Leu Val Leu Ser
                405                 410                 415
Asn Thr Leu Lys Leu Leu Leu Ile Gly Ile Leu Gln Lys Pro Leu Val
                420                 425                 430
Met Lys Thr Thr Ile Asn Ser Ser Ile Phe Cys Leu Arg Phe Thr Asp
                435                 440                 445
Ser Cys Met Ile Ile Met Lys Gly Lys Ile Leu Leu Glu Pro Asn Phe
    450                 455                 460
His Gly Phe Gly Leu Ala Lys Ser Phe Val His Leu Pro Arg Leu Leu
465                 470                 475                 480
Asn Gln Ser Met Ile Leu Thr Phe Ser Leu Ile Cys Ile Met Tyr Leu
                485                 490                 495
Lys Pro Trp Gln Asn Ser Thr Asn Tyr Leu Arg Ser Val Val Gln Arg
                500                 505                 510
Ser His Gln Ile Ile Phe Pro Trp Leu Phe Arg Arg Tyr Ile Ser Lys
    515                 520                 525
Val Thr Lys Ile Ser Val Asn Lys Lys Ala Asn Lys Ile Phe Ile Leu
    530                 535                 540
Cys Ile Leu Ser Asp Gly Cys Ile Ala Ile Arg Phe Gln Gln Ala Pro
545                 550                 555                 560
Thr His Gln Phe Leu Tyr Ile Ile Ala Lys Ile Leu Leu Asn Leu Ser
                565                 570                 575
Ser Gln Phe Thr Asn Ala Val Ile Val Thr Leu Lys Leu Met Thr Leu
                580                 585                 590
Met Thr Tyr Leu Lys Ile Leu Trp Asn Gln Ser Phe Trp Cys Met Arg
    595                 600                 605
Thr Tyr Pro Lys Leu Gln Asn Gly Lys Phe His Ala Leu Val Gln Asp
    610                 615                 620
Ile Leu Lys Thr Trp Asp Leu Ser Ser Gln Asp Lys Glu Ser His Leu
625                 630                 635                 640
Leu Glu Leu Lys Ile Phe Trp Lys Asn Thr Leu Gln Cys Gln Ile Phe
                645                 650                 655
Leu Lys Asn Tyr Phe Lys Thr Leu Met Met Gln Met Gln Gln Asn Ala
                660                 665                 670
```

```
Val Ser Leu Ile Glu Glu Ile Trp Thr Glu Arg Ile Ser Thr Gln Gly
        675             680             685
Trp Gln Leu Val Met Asp Leu Leu Cys Gly His Ser Thr Ile Leu Asn
    690             695             700
Ser Gln Ile Gln Ile Leu Thr Leu Gly Glu Asn Leu Lys Gly Glu Lys
705             710             715             720
Leu Thr Lys Leu Glu Asn Leu Val Leu Asp Leu Ile Leu Cys Thr Ile
            725             730             735
Ser Leu Thr Phe Pro Ser Leu Val Gly Asn Ser Cys Ser Ile Gln Thr
        740             745             750
Ile Ile Ser Val Asn Thr Leu Lys Thr Asn Pro Ile Leu Gly Ser Lys
        755             760             765
Leu Ile Gly Val Asn Asn Arg Lys Asp Leu Glu Asn Phe Leu Ile Ser
    770             775             780
Ser Asn His Leu Met Tyr Leu Ala Val Ser Tyr Leu Leu Lys His Leu
785             790             795             800
Thr Ala Ile Met Glu Pro Phe Ser Asp Cys Pro Leu Glu Leu Asn Arg
            805             810             815
Lys Gln Lys Val Lys Leu Val Val Arg Ala Thr Ile Gln Gln Ile Phe
        820             825             830
Ile Leu Leu Trp Met Asn Leu Val Ser Val Asp Thr Gly Leu Ser Phe
        835             840             845
Ser Leu Arg Val Ser Gln Cys Ile Ser Thr Lys Leu Arg Lys Pro Thr
    850             855             860
Pro Val His Lys Ile Gln Leu Lys Lys Asn Pro Ala Leu Pro Lys His
865             870             875             880
Thr His Leu Ser Val Phe Lys Arg Leu Leu Ser Ser Arg Leu Ala Ala
            885             890             895
Ala Val Ile Lys Ser Phe Pro Val Met Asn Gln Ser His Leu Ala Phe
        900             905             910
Phe Arg Ser Gln Trp Lys Asn Phe Thr Met Cys Ser Glu Gly Leu Leu
    915             920             925
Ile Tyr Ser Arg His Phe Leu Glu Val Gln Met Met Thr Gln Leu Leu
    930             935             940
Ser Leu Lys Trp Leu Ser Leu Ala Asn Gln Lys Ser His Gln Met Ser
945             950             955             960
Cys His Arg Lys Gln Ser Val Pro Arg Gly Phe Cys Val Leu Ala Trp
            965             970             975
Thr Gln Glu Arg Leu Ser Phe Pro Val Arg Val Glu Glu Asp Asp Trp
            980             985             990
Phe His Val Gly Gln Glu Phe Ser Cys Gln Lys Ser Arg Thr Arg Ser
    995             1000            1005
Gly Gln Asn His Thr Leu Glu Arg Cys Phe Ala Ile Tyr Leu Tyr Glu
    1010            1015            1020
Lys Gln Ala Cys Gln Phe Ile Ser Met Gly Ala Leu Leu Leu His Gln
1025            1030            1035            1040
Ile Gly Lys Lys Ser Gly Lys Gln Ile Gln Lys Asp Asp Gly Ile Pro
            1045            1050            1055
Arg Ser Asp Met Leu Leu Lys Leu Thr Tyr Arg Tyr Val Ser Tyr Gly
            1060            1065            1070
Thr Trp Pro Leu Val Gly Ser Trp Ile Ile Leu Thr Met Gln Tyr Gly
            1075            1080            1085
Pro Ile Leu Ile Phe Met Met Ile Phe Leu Phe Ala Lys Asp Phe Met
    1090            1095            1100
Lys Ile Leu Met Glu Lys Gly Lys Asn Pro Lys Ser Ser Leu Met Asp
1105            1110            1115            1120
Leu Leu Gly Phe Pro Arg Thr Asp Phe Met Thr Leu Tyr Leu Lys Glu
            1125            1130            1135
```

Glu Met Leu Val Gln Gln Pro Ser Arg Tyr Phe Asn Thr Ser Arg Arg
            1140   1145   1150
Leu Gly Pro Lys Thr Phe Val Leu Leu Asn Phe Leu Leu Arg Asn Asp
            1155   1160   1165
Leu Lys Lys Leu Ala Ala Asn Arg Tyr Tyr Leu Lys Thr His Phe Gln
        1170   1175   1180
Arg Asn Ser Phe Phe Leu Lys Cys Phe Phe Gln Ile Phe Lys Lys Leu
    1185   1190   1195   1200
Lys Gln Asn Leu Glu Ile Leu Ser Leu Phe Met Lys Lys Leu Met Ser
                1205   1210   1215
Ser Arg Glu Phe Phe Val Leu Leu His Val Phe Leu Val Pro Trp Arg
            1220   1225   1230
Gly Ile Leu Trp Phe Cys His Gln Asp Ser Thr Pro Lys Asp Glu Leu
        1235   1240   1245
Gln Ser Tyr Leu Ile Leu Lys Met Gly Asp Ser Leu Met Val Leu Leu
    1250   1255   1260
Arg Ile Ile Ser Ile Leu Leu Phe Leu Asn Phe Ser Val Trp Gln Lys
1265   1270   1275   1280
Met Ile Phe Tyr Gly Met Ile Cys Asn Val Gln Cys Gln Leu Lys Leu
                1285   1290   1295
Ile Lys Val Ile Met Leu Leu His Ala Glu Val Val Ser Tyr Val Leu
            1300   1305   1310
Ser Met Arg Asn Lys Gly Ile Leu Glu Gln Arg Ile Leu Leu Gln Asn
            1315   1320   1325
Ile Lys Gln Ser Ala Ser Phe His Phe Gln Asn Gln Gln Val Phe Leu
    1330   1335   1340
Trp Thr Gly Lys Ala Thr Val Leu Ser Leu Lys Pro Cys Leu Gln Gln
1345   1350   1355   1360
Leu Thr Phe Ile Gln Leu Asn Ile Lys Ile Phe Val Phe Cys Asn Gln
            1365   1370   1375
Phe Met Lys Ile Pro Ile Leu Leu Glu Val Val Val Gln Cys His Trp
        1380   1385   1390
Leu Leu Lys Ser Phe Trp Asp Tyr Ser Arg Ser Gln Gln Leu Ile Trp
        1395   1400   1405
Leu Thr Asn Lys Lys Gln Asn Gln Leu Met Met Glu Leu His Cys Thr
    1410   1415   1420
Arg Arg Ile Ser Pro Met Leu Ala Thr Asn Thr Phe Met Lys Pro Cys
1425   1430   1435   1440
Lys Met Lys Ser Leu Arg Cys Gln Leu Leu Ile Ser Asn Pro Leu Ala
            1445   1450   1455
Ser Phe Leu Arg Met His Met Leu Thr Gln Lys Arg Phe Leu Phe Ile
        1460   1465   1470
Ile Leu Arg Arg His His Thr Phe Ile Ser Cys Leu Ile Ser Ile Lys
        1475   1480   1485
Ile Ile Ser Ala Asn Phe Leu Lys Pro Trp Val Gly Ser His Ala Leu
    1490   1495   1500
Leu Lys Ile Leu Leu Leu Phe Trp Asn Leu Leu Ile Lys Lys Glu Glu
1505   1510   1515   1520
Gln Ser Lys Gln Lys Arg Ile Phe Ser Phe Ala Asp Glu Ser Val Lys
            1525   1530   1535
Glu Tyr Gly Val Ser Leu Glu Lys Arg Asn Lys Asn Phe Val Arg Lys
            1540   1545   1550
Ile Met Ala Arg Tyr Tyr Cys Gln Ile Leu Ile Leu Cys Phe Ser Leu
    1555   1560   1565
Leu Asn Arg Tyr Ala Thr Met Ile Ala Leu Gly Lys Arg Ile Pro Leu
    1570   1575   1580
Asn Ile Val Met Leu Thr Tyr Pro Gly Lys Gln Asn Glu Gln Ser Gln
1585   1590   1595   1600

Ser Asp Thr Lys Pro Lys Asp Met His Pro Met Ser Val Leu Gln His
            1605   1610   1615
Leu Ala Gln Asn Leu Gly Arg Lys Lys Asn Pro Ala Glu Leu Arg Ala
            1620   1625   1630
Ser Leu Met His Ile Leu Leu Lys Arg Lys Cys Lys Ser Phe Phe Lys
            1635   1640   1645
Met Leu Met Met Gln Arg Arg Gln Lys Ser Val Leu Cys Leu Ile Leu
        1650   1655   1660
Asp Ser Ile Gln Leu Ile Glu Tyr Leu Met Ile Ser Gly Pro His Cys
1665   1670   1675   1680
Lys Gly Gln His Phe Val Cys Thr Thr Thr Ser His Leu Gln Lys Met
            1685   1690   1695
Met Leu Glu Glu Phe Arg Ile Leu Glu Lys Ala Arg Lys Arg Glu Ile
            1700   1705   1710
Leu Ile Lys Leu Asp Ser Met Glu Asp Ser Ile Leu Cys Ile Ile Ser
            1715   1720   1725
Gln Thr Ala His Leu Leu Phe Leu Ala Met Thr Ser Cys Val Phe Leu
            1730   1735   1740
Ile Leu Met Pro Asp Met His Gln Gly Pro His Pro Leu Val Pro Asp
1745   1750   1755   1760
Ala Cys Leu Glu Ile Trp Met Gln Ile Leu Gly His Ser Ser Gln Met
            1765   1770   1775
Phe Trp Ile Phe Ile Trp Glu Pro Ile Leu Asn Trp Ile Ile Ala Gln
            1780   1785   1790
Cys Ser Asp Phe Leu Phe Val Met Gln Lys Trp Gln Lys Phe Arg Lys
            1795   1800   1805
Phe Arg Leu Phe Gln His Gln Thr Glu Trp Ser Arg Ile Phe Trp Thr
            1810   1815   1820
Asn Cys Ala Gln Met Gly Gln Asn Phe Cys Phe Leu Ile Thr Trp Lys
1825   1830   1835   1840
Lys Phe Leu Phe Val Lys Ile Arg Val Leu Glu Leu Met Cys Cys Ile
            1845   1850   1855
Gln Arg Ala Lys Ser Gln Met Glu Thr Asp Lys Gly Asn Asn Phe Met
            1860   1865   1870
His Leu Leu Ile Val Leu Leu Lys Arg Gly Ser Ser Lys Thr Tyr Gln
            1875   1880   1885
Phe Asn Lys Pro Ile Leu Trp Ile Leu Arg Thr Leu Lys Glu Ile Leu
            1890   1895   1900
Leu Arg Gly Phe Val Ile Asp Gln Ala Phe Gln Val Trp Arg Lys Tyr
1905   1910   1915   1920
Leu Lys Val Ser Tyr Gln Leu Thr Arg Thr Lys Ile Leu Leu Phe Ser
            1925   1930   1935
His Val Val Glu Leu Pro Ala Leu Leu Thr Thr Ile Lys Asn Pro Ile
            1940   1945   1950
Gly Pro Ser Val Phe Cys Leu Phe Leu Trp Arg Leu Gly Cys His Phe
            1955   1960   1965
Met Met Ala Thr Leu His Trp Ile Gln Pro Glu Gly Thr Cys Gly Val
    1970   1975   1980
Met Ile Met Glu Leu Val Phe Glu Val Thr Gly Ile Thr Val Gln His
1985   1990   1995   2000
Leu Leu His Met Leu Asn Cys Tyr Ser Lys Asn Gly Ile Ser Leu Val
            2005   2010   2015
Leu Ile Gln His Tyr Gln Cys Tyr Arg Thr Pro Leu Phe Met Leu Arg
            2020   2025   2030
Thr Leu Arg Ser Phe Tyr Arg Phe Ser Gln Leu Thr Val Leu Ile Tyr
            2035   2040   2045
Ser Gln Ile Tyr Ile Val Lys His Phe Thr Ile Ala Phe Thr Lys Thr
    2050   2055   2060

Asn Val Phe Tyr Leu Leu Cys Gly Leu Gln Ile Leu Met Ala Leu Thr
2065   2070   2075   2080
Cys Thr Leu Gln Leu Leu Leu Gly Ser Ile Cys Leu Leu Leu Ile Lys
          2085   2090   2095
Leu Asp His Phe Leu Thr Ile Tyr Tyr Arg Met Asn Tyr Asn Thr Leu
          2100   2105   2110
Lys Met Gln Ile Ile Ile Ser Pro His Ala Lys Gln Gln Arg Met Ser
          2115   2120   2125
Ile Gly Asn Ile Ser Phe Lys Leu Val Ser Thr Trp Phe Ile Thr Val
          2130   2135   2140
Met Lys Leu Leu Ile Phe Thr Thr Val Leu Met Gln Ile Phe Leu Leu
2145   2150   2155   2160
Val Met Pro Leu Leu Ile Ser Asp Leu Phe His Phe Pro Leu Leu Thr
          2165   2170   2175
Leu Ile Ala Ile Leu Gly Ser Cys Leu Val Val Cys Ser Arg Leu Ile
          2180   2185   2190
Asn Phe Phe Ile Val Asn Phe Leu Ile Ile Val Leu Lys Met Gln Lys
          2195   2200   2205
Lys Met Arg Leu Lys Leu Arg Asp Cys Pro Phe Ser Ser His Trp Thr
          2210   2215   2220
Val Phe Cys Lys Leu Leu Met Gln Asn Asp Pro Ser Phe Gln His Ile
2225   2230   2235   2240
Met Asn Phe His Pro Ala Lys Thr Cys Leu Ile His Tyr Ile Asn Ile
          2245   2250   2255
Val Ile Phe Tyr Thr Val Lys Leu Gln Lys Cys Leu Thr Phe Pro Ala
          2260   2265   2270
Leu Leu Ile Cys Tyr Pro Leu Cys Cys Leu Glu Asn Ile Arg Pro Lys
          2275   2280   2285
Val Ala Gln Ser Gly Lys Thr Ile Leu Gln Val Ser Leu Gly Leu Arg
          2290   2295   2300
Met His Gly Ile Leu Leu Val Asn Leu Val Lys Lys Ile Arg Lys Lys
2305   2310   2315   2320
Gln Asn Gln His Leu Thr Leu Leu Leu Ile Leu Lys Thr Gly His Cys
          2325   2330   2335
Phe Gln Glu Gln Ser Leu Leu Phe Gln Pro Thr Ser Leu Trp Phe Leu
          2340   2345   2350
Lys Glu Met Phe Cys Phe Leu Ser Ala Leu Cys Thr Leu Gln Phe Phe
          2355   2360   2365
Gln Met Pro Arg Val Ile Lys Phe Phe Met Leu Lys Pro Ala Val Phe
          2370   2375   2380
Ser Leu Leu Thr Lys Ser Val Pro Lys Thr Val His Leu Phe Leu Cys
2385   2390   2395   2400
Cys His Val Thr Gln Gln Ile Arg Ala Pro Gln Ala Ser Arg Leu Tyr
          2405   2410   2415
Ile Ile Trp Ser Lys Leu Gln His Leu Glu Gln Lys Asn Lys Met Ile
          2420   2425   2430
Leu Arg His Phe Cys Ile Ser Thr Ala Ile Ile Ile Cys Pro Lys Met
          2435   2440   2445
Ile Lys Phe Ser His Phe Arg Ala Ile Asn Pro Ser Val Ala Ala Met
          2450   2455   2460
Ala Leu Glu Asn Leu Glu His Ala Thr Tyr Leu Gln Lys Val Ser Leu
2465   2470   2475   2480
Gln Leu Lys Trp Arg Asn Gly His Asn His His His Leu His Phe Leu
          2485   2490   2495
Lys Lys Lys Tyr Thr Lys Asn Tyr Met Arg Leu Val Val Tyr Leu Met
          2500   2505   2510
Ile Leu Arg Tyr Ile Asn Thr Ser Tyr Gln Lys Leu Lys Ile Ser Leu
          2515   2520   2525

```
Met Met Gln Asn Ser Thr Ser Thr Leu Arg Ile Asp Tyr Gln Val Leu
    2530              2535              2540
Arg Asn Tyr Gln Arg Leu Arg Asn Asn Phe Leu Lys Asn Trp Lys Val
2545              2550              2555              2560
Tyr Ser Met Met Leu Thr Val Asp Ser Lys Gln Ser Ile Ser Met Ile
            2565              2570              2575
Glu Leu Glu Phe Leu Lys Leu Cys Phe Leu Lys Asn Cys Leu Phe Leu
            2580              2585              2590
Met Ile Ser Leu Arg Asn Trp Asn Asn Leu Asn Pro Lys Ile Met Leu
            2595              2600              2605
His Leu His Pro Gly Trp Asn Ser Glu Ile Leu Asp Asn Thr Tyr Phe
    2610              2615              2620
Leu Ser Ser Ser Cys Tyr Ser Leu Leu Arg Lys Ser Val Gly Leu Ile
2625              2630              2635              2640
Gln Lys Thr Gly Pro Lys Lys His Cys Lys Ile Gln Leu Ile Ser Phe
            2645              2650              2655
Cys Ile Ile Tyr Ser Lys Asn Glu Trp Ile Cys Tyr Leu Glu Ile Phe
            2660              2665              2670
Lys Asn Tyr Leu Tyr His Ser Tyr Val Leu Ser Gly Pro Pro Arg Asn
    2675              2680              2685
Ser Leu Asp Phe Ile Leu Asn Ile Lys Arg Met Glu His Phe Leu Leu
    2690              2695              2700
Ser Ser Met Glu His Arg Ile Gln Asn Ser Ser Asn Val Met Tyr Ser
2705              2710              2715              2720
Ser Cys Tyr Gly His Pro Ala Leu Phe Phe Gln Arg Lys Leu His Pro
            2725              2730              2735
Ala Leu Lys Asn Lys Lys Val Val Thr Leu Val His Lys Asn Ser Leu
            2740              2745              2750
Asn Lys Phe Ile Cys Leu Met Leu Thr Trp Ile Leu Leu Leu Ile Arg
    2755              2760              2765
Ser Ile Thr Ala Glu Thr Tyr Ala Thr Arg Arg Trp Met Lys Lys Trp
    2770              2775              2780
Lys Leu Glu Gln Lys Ser Gly Ala Tyr Met Asn Ser Ser Val Gln Lys
2785              2790              2795              2800
Lys Gly Asn Phe Val Phe Ser Cys Glu Gly Leu Leu Leu Trp Lys Met
            2805              2810              2815
Val Gly Asn Phe Ser Leu Arg Arg Ser Thr Asn Met Asn Leu Ile Leu
            2820              2825              2830
Asn Leu Ile Cys Thr Ser Tyr Leu Asn Leu Ala His Phe Thr Ser Cys
    2835              2840              2845
Ser Asn Thr Val Leu Lys Ile Leu Phe Gln Leu Ser Asn Met Leu Lys
    2850              2855              2860
Cys Ala Ala Tyr Leu Lys Ile Leu Arg Ala Asn Asn Ile Leu Met Lys
2865              2870              2875              2880
Cys Val Gln Leu Arg Glu Phe Leu Val Cys Ser Gly Val Tyr Arg Met
            2885              2890              2895
Ile Gln Ser Arg Gly Val Ile Ser Arg Met Tyr Glu Thr Leu Arg Phe
            2900              2905              2910
Thr Ser Gln Ala Arg Met Val Asp Trp Ser Gln Ala Ser Cys Leu Thr
            2915              2920              2925
Met Arg His Ile Ile Lys Val Glu Ser Arg Gly Ile Leu Val Cys Lys
    2930              2935              2940
Cys Leu Ile Ser Ala Ser Ala Thr Gly Lys Thr Met Asp Phe Thr Leu
2945              2950              2955              2960
Ser Cys Ser Phe Leu Lys Asn Leu Asp Leu Asp Tyr Ala Val Tyr Leu
            2965              2970              2975
Lys Asn Asn Met Lys Arg Leu Pro Lys Phe Val Ser Leu Glu Arg Cys
            2980              2985              2990
```

```
Val Leu Phe Lys Glu Asp Cys Ser Tyr Ser Cys Leu Leu Asn Ser Ser
          2995             3000             3005
Leu Gln Asp Leu Glu Leu Ser Met Lys Met Ile Met Leu Phe Trp Pro
    3010             3015             3020
Met Lys Lys Lys Pro Asp Phe Ala Lys Pro Glu Lys Asp Lys Tyr Pro
3025             3030             3035             3040
Ala Leu Lys Ser Phe Lys Gln His Glu Leu Lys Val Leu Ile Leu Phe
          3045             3050             3055
Pro Thr Ala Glu Val Lys Leu Leu Leu Phe Ser Asp Leu Val Met Gln
          3060             3065             3070
Ser Ser Cys Ser Thr Phe Asn Ile Gln Thr Val Lys Thr Leu Ile Ser
          3075             3080             3085
Cys His Trp Gln Leu Leu Asn Gln Gln Leu Thr Ile Phe Leu Thr Leu
    3090             3095             3100
His Ile Leu Leu Cys Asp Ala Met Ile Phe Thr Gly Leu Val Arg Asn
3105             3110             3115             3120
Leu Thr Val Glu Asn Met Thr Leu Arg Ser His Gln Asn Trp Asn Phe
          3125             3130             3135
Gln Cys Leu Ala His Gln Phe Leu Leu Lys Phe Ile Thr Leu Cys Leu
          3140             3145             3150
Trp Thr Gln Met Phe Phe Thr Arg Glu Asn Met Leu Gly Thr Leu Leu
          3155             3160             3165
Met Leu Lys Val Val Ile Ser Met Asp His Thr Ser Gln His Thr His
    3170             3175             3180
Met Gln Leu Leu Tyr Lys Leu Lys Glu Lys Met Leu Thr Ile Leu
3185             3190             3195             3200
Val Phe Glu Arg Tyr Ile Arg Ile Leu Val Ile Val Asn Ile Lys Leu
          3205             3210             3215
Ala Leu Leu Ile Cys Ile Ser Phe Gln Asp Leu Arg Lys Ala Leu Lys
          3220             3225             3230
Ala Gly Thr Val Leu Leu Leu His Gln Pro Ala Pro Leu Ser Ser Ser
    3235             3240             3245
Pro Leu Ala Glu Ala Phe Leu Leu Phe Ser Leu Val Glu Arg Ala Thr
    3250             3255             3260
Arg Leu Leu Pro Asn Ile Ser Pro Pro Lys Ser Leu Arg Leu Ile Leu
3265             3270             3275             3280
Tyr Gln Lys Ser Lys Lys His Leu Trp Trp Ser Lys His Gly Ser Phe
          3285             3290             3295
Gln Asn Arg Asn Glu Lys Arg Leu Leu Gly Gly Cys Ile Asn Gly Ile
          3300             3305             3310
Leu Thr Lys Ile Gln Arg Thr Met Thr Leu Pro Met Lys Phe Leu Asn
    3315             3320             3325
Ile Cys Arg Met Lys Ser Thr Asp Lys Asn Arg Leu Phe Ile Lys Met
    3330             3335             3340
Gln Thr Gly Pro Pro Asp Glu His Phe Gln Pro Gln His Pro Asp Phe
3345             3350             3355             3360
Ser Gln Thr Asn Thr His Phe Arg Asp Ser Ile Leu His Gly Ile Lys
          3365             3370             3375
Lys Gln Arg Ala Ile Asn Leu Lys Asp Ser Asn Arg Thr Lys Lys Asn
          3380             3385             3390
Ala Pro Leu Gln Pro Asp Arg Leu Thr Leu Lys Gly Ser Leu Phe Leu
    3395             3400             3405
Pro Leu Ser Ser Arg Leu Ala Ile Gln Trp Lys His Ala Asp Gly Asp
    3410             3415             3420
Lys Pro Glu Gln Thr Ser Gln Leu Pro Gly Met Thr Phe Ile Lys Met
3425             3430             3435             3440
Pro Met Ser Gly Cys Ala Leu Asn Val Thr Phe Leu Pro Ser Leu Leu
          3445             3450             3455
```

```
Gln Leu Thr Met Leu Gly Glu Ser Leu Ile Lys Met Asn Gln Leu His
            3460                3465            3470
Leu Leu Arg Lys Arg Asn Ile Val Ser Asn Leu Lys Asp Gln Met Met
            3475                3480            3485
Phe Thr His Trp Lys Leu Met Val Thr Val Lys Gln Asp Thr Leu Ile
            3490                3495            3500
Cys Phe Pro Phe Leu Arg Ser Gln Met Thr Gly Ser Leu Leu Arg Leu
3505                3510            3515                3520
Leu Gly Trp Asn Val Leu Pro Val Ser Asn Leu Lys Ile Leu Cys Asn
            3525                3530            3535
Lys Lys Cys Glu Asp Ile Arg Lys Lys Arg Ile Leu Asn Val Leu His
            3540                3545            3550
Glu Ile Ala Val Leu His Ala
            3555
```

<210> 11
<211> 12793
<212> DNA
<213> Homo sapiens

<400> 11
```
atgatttaca ggaagaccat gtactcagct gcagcttcta aatccagaac gatttgcacg 60
tcttatcaag gaagtaatga atacattctg gcctggcaga gaattgattg ttcaatggta 120
tccatttgat gaaaacagaa atcacccatc tgtttcatgg cttaagatgg tttggaaaaa 180
tctttatata cattttttcag aggatttgac tttatttgat gagatgccac ttatccccag 240
aactatacta gaggaaggtc agacatgtgt ggaactcatt agactcagga ttccatcgtt 300
agtcatttta gacgatgaat ctgaagcaca gcttccagaa tttttagcag acattgtaca 360
aaaacttgga gggtttgtcc ttaaaaaatt agatgcatct atacaacatc cgcttattaa 420
aaaatatatt cattcaccat taccaagtgc tgttttgcag ataatggaga agatgccatt 480
gcagaaattg tgtaatcaaa taacttcgct acttccaaca cacaaagatg ccctgaggaa 540
gttcttggct agtttaaccg atagcagtga gaaagagaaa agaattattc aagaattggc 600
aatattcaag cgcattaacc attcttctga tcagggaatt tcctcttata caaaattgaa 660
aggttgtaaa gtcttacacc atactgccaa actcccagca gatctgcgac tttctatttc 720
agtaatagac agtagtgatg aagctactat tcgtctggca aacatgttga aaatagaaca 780
gttaaagacc actagctgct aaagcttgt tttaaaagat attgaaaatg catttattc 840
acatgaagag gtaacacagc ttatgttatg ggtccttgag aatctatctt ctcttaaaaa 900
tgagaatcca aatgtgcttg agtggttaac accattaaaa ttcatccaga tatcacagga 960
acagatggta tcagctggtg aactctttga ccctgatata gaagtactaa aggatctctt 1020
ttgtaatgaa gaaggaacct atttcccacc ctcagttttt acctcaccag atattcttca 1080
ctccttaaga cagattggtt taaaaaacga agccagtctc aaagaaaagg atgttgtgca 1140
agtggcaaaa aaaattgaag ccttacaggt cggtgcttgt cctgatcaag atgttcttct 1200
gaagaaagcc aaaaccctct tactggtttt aaataagaat cacacactgt tgcaatcatc 1260
tgaaggaaag atgacattga agaaaataaa atgggttcca gcctgcaagg aaaggcctcc 1320
aaattatcca ggctctttgg tctggaaagg agatctctgt aatctctgtg caccaccaga 1380
tatgtgtgat gtaggccatg caattctcat tggctcctca cttcctcttg ttgaaagtat 1440
ccatgtaaac ctggaaaaag cattagggat cttcacaaaa cctagcctta gtgctgtctt 1500
aaaacacttt aaaattgttg ttgattggta ttcttcaaaa acctttagtg atgaagacta 1560
ctatcaattc cagcatattt tgcttgagat ttacggattc atgcatgatc atctaaatga 1620
agggaaagat tctttttagag ccttaaaatt tccatgggtt tggactggca aaaagttttg 1680
tccacttgcc caggctgtga ttaaaccaat ccatgatctt gaccttcagc cttatttgca 1740
taatgtacct aaaaccatgg caaaattcca ccaactattt aaggtctgtg ttcaatagga 1800
ggagttgaca tcagatcata tttccatggt tattcagaag atatatctca aaagtgacca 1860
agatctcagt gaacaagaaa gcaaacaaaa tcttcatctt atgttgaata ttatcagatg 1920
gctgtatagc aatcagattc cagcaagccc caacacacca gttcctatac atcatagcaa 1980
aaatccttct aaacttatca tgaagccaat tcacgaatgc tgttattgtg acattaaagt 2040
tgatgacctt aatgacttac ttgaagattc tgtggaacca atcattttgg tgcatgagga 2100
catacccatg aaaactgcag aatggctaaa agttccatgc cttagtacaa gactgataaa 2160
```

```
tcctgaaaac atgggatttg agcagtcagg acaaagagag ccacttactg taagaattaa 2220
aaatattctg gaagaatacc cttcagtgtc agatattttt aaagaactac ttcaaaacgc 2280
tgatgatgca aatgcaacag aatgcagttt cttgattgat atgagaagaa atatggacat 2340
aagagagaat ctcctagacc cagggatggc agcttgtcat ggacctgctt tgtggtcatt 2400
caacaattct caattctcag attcagattt tgtgaacata actaggttag gagaatcttt 2460
aaaaagggga gaagttgaca aagttggaaa atttggtctt ggatttaatt ctgtgtacca 2520
tatcactgac attcccatca ttatgagtcg ggaattcatg ataatgttcg atccaaacat 2580
aaatcatatc agtaaacaca ttaaagacaa atccaatcct gggatcaaaa ttaattggag 2640
taaacaacag aaaagactta gaaaatttcc taatcagttc aaaccattta tagatgtatt 2700
tggctgtcag ttacctttga ctgtagaagc accttacagc tataatggaa cccttttccg 2760
actgtccttt agaactcaac aggaagcaaa agtgagtgaa gttagtagta cgtgctacaa 2820
tacagcagat atttattctc ttgtggatga atttagtctc tgtggacaca ggcttatcat 2880
tttcactcag agtgtaaagt caatgtattt gaagtacttg aaaattgagg aaaccaaccc 2940
cagtttagca caagatacag taataattaa aaaaaaatcc tgctcttcca aagcattgaa 3000
cacacctgtc ttaagtgttt taaaagaggc tgctaagctc atgaagactt gcagcagcag 3060
taataaaaag cttcccagtg atgaaccaaa gtcatcttgc attcttcaga tcacagtgga 3120
agaatttcac catgtgttca gaaggattgc tgatttacag tcgccacttt ttagaggtcc 3180
agatgatgac ccagctgctc tctttgaaat ggctaagtct ggccaatcaa aaaagccatc 3240
agatgagttg tcacagaaaa cagtagagtg taccacgtgg cttctgtgta cttgcatgga 3300
cacaggagag gctctgaagt tttccctgag tgagagtgga agaagactag gactggttcc 3360
atgtggggca gtaggagttc agctgtcaga aatccaggac cagaagtgga cagtgaaacc 3420
acacattgga gaggtgtttt gctatttacc tttacgaata aaaacaggct tgccagttca 3480
tatcaatggg tgctttgctg ttacatcaaa taggaaagaa atctggaaaa cagatacaaa 3540
aggacgatgg aataccacgt tcatgagaca tgttattgtg aaagcttact tacaggtact 3600
gagtgtctta cgggacctgg ccactagtgg ggagctaatg gattatactt actatgcagt 3660
atggcccgat cctgatttag ttcatgatga tttttctgta atttgccaag gattttatga 3720
agatatagct catggaaaag ggaagaact gaccaaagtc ttctctgatg gatctacttg 3780
ggtttccatg aagaacgtaa gatttctaga tgactctata cttaaaagaa gagatgttgg 3840
ttcagcagcc ttcaagatat tttttgaaata cctcaagaag actgggtcca aaaacctttg 3900
tgctgttgaa cttccttctt cggtaaaatt aggatttgaa gaagttggct gcaaacagat 3960
actacttgaa aacacatttt cagagaaaca gttttttttct gaagtgtttt ttccaaatat 4020
tcaagaaatt gaagcagaac ttagagatcc tttaatgatc tttgttctaa atgaaaaagt 4080
tgatgagttc tcgggagttc ttcgtgttac tccatgtatt ccttgttcct tggaggggca 4140
tcctttggtt ttgccatcaa gattgatcca ccccgaagga cgagttgcaa agttatttga 4200
tattaaagat gggagattcc cttatggttc tactcaggat tatctcaatc ctattatttt 4260
gattaaacta gttcagttag gtatggcaaa agatgatatt ttatgggatg atatgctaga 4320
acgtgcagtg tcagtagctg aaattaataa aagtgatcat gttgctgcat gcctaagaag 4380
tagtatctta ttgagtctta tcgatgagaa actaaaaata agggatccta gagcaaagga 4440
ttttgctgca aaatatcaaa caatccgctt ccttccattt ctgacaaaac cagcaggttt 4500
ttctttggac tggaaaggca acagttttaa gcctgaaacc atgtttgcag caactgacct 4560
ttatacagct gaacatcaag atatagtttg tcttttgcaa ccaattctaa atgaaaattc 4620
ccattctttt agaggttgtg gttcagtgtc attggctgtt aaagagtttt tgggattact 4680
caagaagcca acagttgatc tggttataaa ccaattgaaa gaagtagcaa aatcagttga 4740
tgatggaatt acactgtacc aggagaatat caccaatgct tgctacaaat accttcatga 4800
agccttgatg caaaatgaaa tcactaagat gtcaattatt gataagttaa aaccctttag 4860
cttcattcta gttgagaatg catatgttga ctcagaaaag gtttctttttc atttaaattt 4920
tgaggcggca ccataccttt atcagttgcc taataagtat aaaaataatt ccgcgaact 4980
ttttgaaacc gtgggtgtga ggcagtcatg cactgttgaa gattttgctc ttgttttgga 5040
atctattgat caagaaagag gaacaaagca aataacagaa gagaattttc agctttgccg 5100
acgaataatc agtgaaggaa tatggagtct cattagagaa aagaaacaag aattttgtga 5160
gaaaaattat ggcaagatat tattgccaga tactaatctt atgcttctcc ctgctaaatc 5220
gttatgctac aatgattgcc cttggataaa agtaaaggat accactgtaa aatattgtca 5280
tgctgacata cccagggaag tagcagtaaa actaggagca gtcccaaagc gacacaaagc 5340
cttagaaaga tatgcatcca atgtctgttt tacaacactt ggcacagaat ttgggcagaa 5400
agaaaaattg accagcagaa ttaagagcat ccttaatgca tatccttctg aaaaggaaat 5460
gttgaaagag cttcttcaaa atgctgatga tgcaaaggcg acagaaatct gttttgtgtt 5520
tgatcctaga cagcatccag ttgatagaat atttgatgat aagtgggccc cattgcaagg 5580
gccagcactt tgtgtgtaca acaaccagcc atttacagaa gatgatgtta gaggaattca 5640
```

```
gaatcttgga aaaggcacga aagagggaaa tccttataaa actggacagt atggaatagg 5700
attcaattct gtgtatcata tcacagactg cccatctttt atttctggca atgacatcct 5760
gtgtattttt gatcctcatg ccagatatgc accaggggcc acatccatta gtcccggacg 5820
catgtttaga gatttggatg cagatttttag gacacagttc tcagatgttc tggatcttta 5880
tctgggaacc cattttaaac tggataattg cacaatgttc agatttcctc ttcgtaatgc 5940
agaaatggca aaagtttcgg aaatttcgtc tgttccagca tcagacagaa tggtccagaa 6000
tcttttggac aaactgcgct cagatggggc agaacttcta atgtttctta atcacatgga 6060
aaaaatttct atttgtgaaa tagataagag tactggagct ctaaatgtgc tgtattcagt 6120
aaagggcaaa atcacagatg gagacagatt gaaaaggaaa caatttcatg catctgtaat 6180
tgatagtgtt actaaaaaga ggcagctcaa agacatacca gttcaacaaa taacctatac 6240
tatggatact gaggactctg aaggaaatct tactacgtgg ctaatttgta atagatcagg 6300
cttttcaagt atggagaaag tatctaaaag tgtcatatca gctcacaaga accaagatat 6360
tactcttttc ccacgtggtg gagtagctgc ctgcattact cacaactata aaaaacccca 6420
tagggccttc tgttttttgc ctctttcttt ggagactggg ctgccatttc atgtgaatgg 6480
ccactttgca ctggattcag ccagaaggaa cctgtggcgt gatgataatg gagttggtgt 6540
tcgaagtgac tggaataaca gtttaatgac agcattaata gctcctgcat atgttgaatt 6600
gctaatacag ttaaaaaaac ggtatttccc tggttctgat ccaacattat cagtgttaca 6660
gaacacccct attcatgttg taaaggacac tttaaagaag ttttttatcgt ttttcccagt 6720
taaccgtctt gatctacagc cagatttata ttgtctagtg aaagcacttt acaattgcat 6780
tcacgaagac atgaaacgtc ttttacctgt tgtgcgggct ccaaatattg atggctctga 6840
cttgcactct gcagttataa ttacttggat caatatgtct acttctaata aaactagacc 6900
attttttgac aatttactac aggatgaatt acaacacctt aaaaatgcag attataatat 6960
caccacacgc aaaacagtag cagagaatgt ctataggctg aaacatctcc ttttagaaat 7020
tggtttcaac ttggtttata actgtgatga aactgctaat ctttaccact gtcttataga 7080
tgcagatatt cctgttagtt atgtgacccc tgctgatatc agatcttttt taatgacatt 7140
ttcctctcct gacactaatt gccatattgg gaagctgcct tgtcgtctgc agcagactaa 7200
tctaaaactt tttcatagtt taaaacttttt agttgattat tgtttaaag atgcagaaga 7260
aaatgagatt gaagttgagg gattgcccct tctcatcaca ctggacagtg ttttgcaaac 7320
ttttgatgca aaacgaccca agttctaac aacatatcat gaattgattc catcccgcaa 7380
agacttgttt atgaatacat tatatttgaa atatagtaat attttattga actgtaaagt 7440
tgcaaaagtg tttgacattt ccagctttgc tgatttgtta tcctctgtgt tgcctcgaga 7500
atataagacc aaaagttgca caaagtggaa agacaatttt gcaagtgagt cttggcttaa 7560
gaatgcatgg cattttatta gtgaatctgt aagtgtgaaa gaagatcagg aagaaacaaa 7620
accaacattt gacattgttg ttgatactct aaaagactgg gcattgcttc caggaacaaa 7680
gtttactgtt tcagccaacc agcttgtggt tcctgaagga gatgttctgc ttcctctcag 7740
ccttatgcac attgcagttt ttccaaatgc ccagagtgat aaagtttttc atgctctaat 7800
gaaagccggc tgtattcagc ttgctttgaa caaaatctgt tccaaagaca gtgcatttgt 7860
tcctttgttg tcatgtcaca cagcaaatat agagagcccc acaagcatct tgaaggctct 7920
acattatatg gtccaaactt caacatttag agcagaaaaa ttagtagaaa atgattttga 7980
ggcacttttg atgtatttca actgcaattt gaatcatttg atgtcccaag atgatataaa 8040
aattctaaag tcacttccgt gctataaatc catcagtggc cgctatgtaa gcattggaaa 8100
atttggaaca tgctacgtac ttacaaaaag tatcccttca gctgaagtgg agaaatggac 8160
acaatcatca tcatctgcat ttcttgaaga aaaaatacac ttaaaagaac tatatgaggt 8220
gattggttgt gtacctgtag atgatcttga ggtatatttg aaacacctct accaaaaat 8280
tgaaaatctc tcttatgatg caaaattaga gcacttgatc taccttaaga atagattatc 8340
aagtgctgag gaattatcag agattaagga acaacttttt gaaaaactgg aaagtttatt 8400
gataatccat gatgctaaca gtagactaaa gcaagcaaag catttctatg atagaactgt 8460
gagagttttt gaagttatgc ttcctgaaaa attgtttatt cctaatgatt tctttaagaa 8520
attggaacaa cttataaaac ccaaaaatca tgttacattt atgacatcct gggtggaatt 8580
cttaagaaat attggactaa aatacatact ttctcagcag cagttgttac agtttgctaa 8640
ggaaatcagt gtgagggcta atacagaaaa ctggtccaaa gaaacattgc aaaatacagt 8700
tgatatcctt ctgcatcata tattccaaga acgaatggat ttgttatctg gaaattttct 8760
gaaagaacta tctttaatac cattcttatg tcctgagcgg gcccccgcgg aattcattag 8820
atttcatcct caatatcaag aggtaaatgg aacacttcct cttataaagt tcaatggagc 8880
acaggtaaat ccaaaattca agcaatgtga tgtactccag ctgttatgga catcctgccc 8940
tattcttcca gagaaagcta cacccttaag cattaaagaa caagaaggta gtgaccttgg 9000
tccacaagaa cagcttgaac aagtttttaaa tatgcttaat gttaacctgg atcctcctct 9060
tgataaggta atcaataact gcagaaacat atgcaacata cgacgttgg atgaagaaat 9120
```

```
ggtaaaaact agagcaaaag tcttaaggag catatatgaa ttcctcagtg cagaaaaaag 9180
ggaatttcgt tttcagttgc gaggggttgc ttttgtgatg gtagaagatg gttggaaact 9240
tctgaagcct gaggaggtag tcataaacct agaatatgaa tctgatttta aaccttattt 9300
gtacaagcta cctttagaac ttggcacatt tcaccagttg ttcaaacact taggtactga 9360
agatattatt tcaactaagc aatatgttga agtgttgagc cgcatattta aaaattctga 9420
gggcaaacaa ttagatccta atgaaatgcg tacagttaag agagtagttt ctggtctgtt 9480
caggagtcta cagaatgatt cagtcaaggt gaggagtgat ctcgagaatg tacgagacct 9540
tgcgctttac ctcccaagcc aggatggtag attggtaaag tcaagcatct tagtgtttga 9600
cgatgcgcca cattataaaa gtagaatcca ggggaatatt ggtgtgcaaa tgttagttga 9660
tctcagccag tgctacttag ggaaagacca tggatttcac actaagttga taatgctctt 9720
tcctcaaaaa cttagacctc gattattgag cagtatactt gaagaacaat tagatgaaga 9780
gactcccaaa gtttgtcagt ttggagcgtt gtgttctctt caaggaagat tgcagttact 9840
cttgtcttct gaacagttca ttacaggact gattagaatt atgaagcatg aaaatgataa 9900
tgctttctg gccaatgaag aaaaagccat aagactttgc aaagccctaa gagaaggatt 9960
gaaagtatcc tgctttgaaa agcttcaaac aacattaaga gttaaaggtt ttaatcctat 10020
tccccacagc agaagtgaaa cttttgcttt tttgaagcga tttggtaatg cagtcatctt 10080
gctctacatt caacattcag acagtaaaga cattaatttc ctgttagcac tggcaatgac 10140
tcttaaatca gcaactgaca atttgatttc tgacacttca tatttaattg ctatgctagg 10200
atgcaatgat atttacagga ttggtgagaa acttgacagt ttaggagtga aatatgactc 10260
ttcggagcca tcaaaactgg aacttccaat gcctggcaca ccaattcctg ctgaaattca 10320
ttacactctg cttatggacc caatgaatgt tttttacccg ggagaatatg ttgggtacct 10380
tgttgatgct gaaggtggtg atatctatgg atcataccag ccaacataca catatgcaat 10440
tattgtacaa gaagttgaaa gagaagatgc tgacaattct agttttctag gaaagatata 10500
tcagatagat attggttata gtgaatataa aatagttagc tctcttgatc tgtataagtt 10560
ttcaagacct gaggaaagct ctcaaagcag ggacagtgct ccttctacac caaccagccc 10620
cactgagttc ctcaccctg gcctgagaag cattcctcct cttttctctg gtagagagag 10680
ccacaagact tcttccaaac atcagtcccc caaaaagctt aaggttaatt ctttaccaga 10740
aatcttaaaa gaagtgacat ctgtggtgga gcaagcatgg aagcttccag aatcggaacg 10800
aaaaaagatt attaggcggt tgtatttgaa atggcatcct gacaaaaatc cagagaaaca 10860
tgacattgcc aatgaagttt ttaaacattt gcagaatgaa atcaacagat tagaaaaaca 10920
ggcttttcta gatcaaaatg cagacagggc ctccagacga acattttcaa cctcagcatc 10980
ccgatttcag tcagacaaat actcatttca gagattctat acttcatgga atcaagaagc 11040
aacgagccat aaatctgaaa gacagcaaca gaacaaagaa aaatgccccc cttcagccgg 11100
acagacttac tctcaaaggt tctttgttcc tcccactttc aagtcggttg gcaatccagt 11160
ggaagcacgc agatggctaa gacaagccag agcaaacttc tcagctgcca ggaatgacct 11220
tcataaaaat gccaatgagt gggtgtgctt taaatgttac ctttctacca agttagcttt 11280
gattgcagct gactatgctg tgaggggaaa gtctgataaa gatgtaaaac caactgcact 11340
tgctcagaaa atagaggaat atagtcagca acttgaagga ctgacaaatg atgttcacac 11400
attggaagct tatggtgtag acagtttaaa aacaagatac cctgatttgc ttcccttttcc 11460
tcagatccca aatgacaggt tcacttctga ggttgctatg agggtgatgg aatgtactgc 11520
ctgtatcata ataaaacttg aaaattttat gcaacaaaaa gtgtgaagat atttaacgaa 11580
aaaaaggta gatcttgaat gtgttgtagc acgaataaat tgctgtactt cattaagctt 11640
cattgccaat tagctaggaa ttgttaagca cattgcagat tgttcttgga gaattctgga 11700
gttgttatga acatgaatac caacggaaaa ccttaactga atctaaaaga aaactatttt 11760
gaagatggtg gtgagctgca aaatagctgg atggatttga atgattggga tgatacatca 11820
ttgaactgca ctttatataa ccaaagctta gcagtttgtt agataagagt ctatgtatgt 11880
ctctggttag gatgaagtta attttatgtt tttaacatgg tatttttgaa ggagctaatg 11940
aaacactgga catataattg gtttaaacat aaggggaatt aagtctttgt agtctgtcat 12000
ttttttaagt ggatcctctt ggatgcgtta ttttctcatc agctggctct gatcatgaat 12060
ttgttgtaat tttatgttgt actcagtgca tttaagaaat ggtagagtat tttaatccta 12120
ttacttgact aagagtgtga aggtagtact ttttagagtg cactgagtgc actttacatc 12180
tttatttaaa tttttttta acatcttatg tttacaggct tcctgtttga tgaagatagc 12240
aacggaaaac tcaaaatggt ggcagttctt attaccagtt gttagtattg tttctggaaa 12300
ctgcttgcca agacaacatt tattaactgt tagaacactt gctttatgtt tgtgtgtaca 12360
tattttccac aaatgttata atttatatag tgtggttgaa caggatgcaa tctttttgttg 12420
tctaaaggtg ctgcagttaa aaaaaaaaca accttttctt tcaatatggc atgtagtgga 12480
gttttttttaa ctttaaaaac atcaaaaatt gttaaaatca ttgtgttatc tagtagttta 12540
taattatcgg cttatatttc cccatgaatg atcagaactg acatttaatt catgtttgtc 12600
```

```
tcgccatgct tctttacttt aacatatttc ttttgcagaa tgtaaaaggt aatgataatt 12660
agtttatata agtgtactgg ctgtaaatga tgctaaatat actttatgca attaagggct 12720
tacagaacat gttgaaactt ttttttacttt tattgggaat aaggaatgtt tgcacctcca 12780
cattttattg ctt                                                    12793
```

```
<210> 12
<211> 12793
<212> DNA
<213> Homo sapiens

<400> 12
atgatttaca ggaagaccat gtactcagct gcagcttcta aatccagaac gatttgcacg 60
tcttatcaag gaagtaatga atacattctg gcctggcaga gaattgattg ttcaatggta 120
tccatttgat gaaaacagaa atcacccatc tgtttcatgg cttaagatgg tttggaaaaa 180
tctttatata cattttcag aggatttgac tttatttgat gagatgccac ttatccccag 240
aactatacta gaggaaggtc agacatgtgt ggaactcatt agactcagga ttccatcgtt 300
agtcatttta gacgatgaat ctgaagcaca gcttccagaa tttttagcag acattgtaca 360
aaaacttgga gggtttgtcc ttaaaaaatt agatgcatct atacaacatc cgcttattaa 420
aaaatatatt cattcaccat taccaagtgc tgttttgcag ataatggaga agatgccatt 480
gcagaaattg tgtaatcaaa taacttcgct acttccaaca cacaaagatg ccctgaggaa 540
gttcttggct agtttaaccg atagcagtga gaaagagaaa agaattattc aagaattggc 600
aatattcaag cgcattaacc attcttctga tcagggaatt tcctcttata caaaattgaa 660
aggttgtaaa gtcttacacc atactgccaa actcccagca gatctgcgac tttctatttc 720
agtaatagac agtagtgatg aagctactat tcgtctggca aacatgttga aaatagaaca 780
gttaaagacc actagctgct aaagcttgt tttaaaagat attgaaaatg cattttattc 840
acatgaagag gtaacacagc ttatgttatg ggtccttgag aatctatctt ctcttaaaaa 900
tgagaatcca aatgtgcttg agtggttaac accattaaaa ttcatccaga tatcacagga 960
acagatggta tcagctggtg aactctttga ccctgatata gaagtactaa aggatctctt 1020
ttgtaatgaa gaaggaacct atttcccacc ctcagttttt acctcaccag atattcttca 1080
ctccttaaga cagattggtt taaaaaacga agccagtctc aaagaaaagg atgttgtgca 1140
agtggcaaaa aaaattgaag ccttacaggt cggtgcttgt cctgatcaag atgttcttct 1200
gaagaaagcc aaaaccctct tactggtttt aaataagaat cacacactgt tgcaatcatc 1260
tgaaggaaag atgacattga agaaaataaa atgggttcca gcctgcaagg aaaggcctcc 1320
aaattatcca ggctctttgg tctggaaagg agatctctgt aatctctgtg caccaccaga 1380
tatgtgtgat gtaggccatg caattctcat tggctcctca cttcctcttg ttgaaagtat 1440
ccatgtaaac ctggaaaaag cattagggat cttcacaaaa cctagcctta gtgctgtctt 1500
aaaacacttt aaaattgttg ttgattggta ttcttcaaaa acctttagtg atgaagacta 1560
ctatcaattc cagcatattt tgcttgagat ttacggattc atgcatgatc atctaaatga 1620
agggaaagat tcttttagag ccttaaaatt tccatgggtt tggactggca aaaagttttg 1680
tccacttgcc caggctgtga ttaaaccaat ccatgatctt gaccttcagc cttatttgca 1740
taatgtacct aaaaccatgg caaaattcca ccaactattt aaggtctgtg gttcaataga 1800
ggagttgaca tcagatcata tttccatggt tattcagaag atatatctca aaagtgacca 1860
agatctcagt gaacaagaaa gcaaacaaaa tcttcatctt atgttgaata ttatcagatg 1920
gctgtatagc aatcagattc cagcaagccc caacacacca gttcctatac atcatagcaa 1980
aaatccttct aaacttatca tgaagccaat tcacgaatgc tgttattgtg acattaaagt 2040
tgatgacctt aatgacttac ttgaagattc tgtggaacca atcattttgg tgcatgagga 2100
catacccatg aaaactgcag aatggctaaa agttccatgc cttagtacaa gactgataaa 2160
tcctgaaaac atgggatttg agcagtcagg acaaagagag ccacttactg taagaattaa 2220
aaatattctg gaagaatacc cttcagtgtc agatattttt aaagaactac ttcaaaacgc 2280
tgatgatgca aatgcaacag aatgcagttt cttgattgat atgagaagaa atatggacat 2340
aagagagaat ctcctagacc cagggatggc agcttgtcat ggacctgctt tgtggtcatt 2400
caacaattct caattctcag attcagattt tgtgaacata actaggttag gagaatcttt 2460
aaaaagggga gaagttgaca aagttggaaa atttggtctt ggatttaatt ctgtgtacca 2520
tatcactgac attcccatca ttatgagtcg ggaattcatg ataatgttcg atccaaacat 2580
aaatcatatc agtaaacaca ttaaagacaa atccaatcct gggatcaaaa ttaattggag 2640
taaacaacag aaaagactta gaaaatttcc taatcagttc aaaccattta tagatgtatt 2700
```

```
tggctgtcag ttacctttga ctgtagaagc accttacagc tataatggaa cccttttccg 2760
actgtccttt agaactcaac aggaagcaaa agtgagtgaa gttagtagta cgtgctacaa 2820
tacagcagat atttattctc ttgtggatga atttagtctc tgtggacaca ggcttatcat 2880
tttcactcag agtgtaaagt caatgtattt gaagtacttg aaaattgagg aaaccaaccc 2940
cagtttagca caagatacag taataattaa aaaaaaatcc tgctcttcca aagcattgaa 3000
cacacctgtc ttaagtgttt taaaagaggc tgctaagctc atgaagactt gcagcagcag 3060
taataaaaag cttcccagtg atgaaccaaa gtcatcttgc attcttcaga tcacagtgga 3120
agaatttcac catgtgttca gaaggattgc tgatttacag tcgccacttt ttagaggtcc 3180
agatgatgac ccagctgctc tctttgaaat ggctaagtct ggccaatcaa aaaagccatc 3240
agatgagttg tcacagaaaa cagtagagtg taccacgtgg cttctgtgta cttgcatgga 3300
cacaggagag gctctgaagt tttccctgag tgagagtgga agaagactag gactggttcc 3360
atgtgggggca gtaggagttc agctgtcaga aatccaggac cagaagtgga cagtgaaacc 3420
acacattgga gaggtgtttt gctatttacc tttacgaata aaaacaggct tgccagttca 3480
tatcaatggg tgctttgctg ttacatcaaa taggaaagaa atctggaaaa cagatacaaa 3540
aggacgatgg aataccacgt tcatgagaca tgttattgtg aaagcttact tacaggtact 3600
gagtgtctta cgggacctgg ccactagtgg ggagctaatg gattatactt actatgcagt 3660
atggcccgat cctgatttag ttcatgatga tttttctgta atttgccaag gattttatga 3720
agatatagct catggaaaag ggaaagaact gaccaaagtc ttctctgatg gatctacttg 3780
ggtttccatg aagaacgtaa gatttctaga tgactctata cttaaaagaa gagatgttgg 3840
ttcagcagcc ttcaagatat ttttgaaata cctcaagaag actgggtcca aaaacctttg 3900
tgctgttgaa cttccttctt cggtaaaatt aggatttgaa gaagctggct gcaaacagat 3960
actacttgaa aacacatttt cagagaaaca gttttttttct gaagtgtttt ttccaaatat 4020
tcaagaaatt gaagcagaac ttagagatcc tttaatgatc tttgttctaa atgaaaaagt 4080
tgatgagttc tcgggagttc ttcgtgttac tccatgtatt ccttgttcct tggaggggca 4140
tcctttggtt ttgccatcaa gattgatcca ccccgaagga cgagttgcaa agttatttga 4200
tattaaagat gggagattcc cttatggttc tactcaggat tatctcaatc ctattatttt 4260
gattaaacta gttcagttag gtatggcaaa agatgatatt ttatgggatg atatgctaga 4320
acgtgcagtg tcagtagctg aaattaataa aagtgatcat gttgctgcat gcctaagaag 4380
tagtatctta ttgagtctta tcgatgagaa actaaaaata agggatccta gagcaaagga 4440
ttttgctgca aaatatcaaa caatccgctt ccttccattt ctgacaaaac cagcaggttt 4500
ttctttggac tggaaaggca acagttttaa gcctgaaacc atgtttgcag caactgacct 4560
ttatacagct gaacatcaag atatagtttg tcttttgcaa ccaattctaa atgaaaattc 4620
ccattctttt agaggttgtg gttcagtgtc attggctgtt aaagagtttt tgggattact 4680
caagaagcca acagttgatc tggttataaa ccaattgaaa gaagtagcaa aatcagttga 4740
tgatggaatt acactgtacc aggagaatat caccaatgct tgctacaaat accttcatga 4800
agccttgatg caaaatgaaa tcactaagat gtcaattatt gataagttaa aacccttag 4860
cttcattcta gttgagaatg catatgttga ctcagaaaag gtttcttttc atttaaattt 4920
tgaggcggca ccataccttt atcagttgcc taataagtat aaaaataatt ccgcgaact 4980
ttttgaaacc gtgggtgtga ggcagtcatg cactgttgaa gattttgctc ttgttttgga 5040
atctattgat caagaaagag gaacaaagca aataacagaa gagaattttc agctttgccg 5100
acgaataatc agtgaaggaa tatggagtct cattagagaa aagaaacaag aattttgtga 5160
gaaaaattat ggcaagatat tattgccaga tactaatctt atgcttctcc ctgctaaatc 5220
gttatgctac aatgattgcc cttggataaa agtaaaggat accactgtaa aatattgtca 5280
tgctgacata cccagggaag tagcagtaaa actaggagca gtcccaaagc gacacaaagc 5340
cttagaaaga tatgcatcca atgtctgttt tacaacactt ggcacagaat ttgggcagaa 5400
agaaaaattg accagcagaa ttaagagcat ccttaatgca tatccttctg aaaaggaaat 5460
gttgaaagag cttcttcaaa atgctgatga tgcaaaggcg acagaaatct gttttgtgtt 5520
tgatcctaga cagcatccag ttgatagaat atttgatgat aagtgggccc cattgcaagg 5580
gccagcactt tgtgtgtaca acaaccagcc atttacagaa gatgatgtta gaggaattca 5640
gaatcttgga aaaggcacga aagagggaaa tccttataaa actggacagt atggaatagg 5700
attcaattct gtgtatcata tcacagactg cccatctttt atttctggca atgacatcct 5760
gtgtattttt gatcctcatg ccagatatgc accaggggcc acatccatta gtcccggacg 5820
catgtttaga gatttggatg cagattttag gacacagttc tcagatgttc tggatcttta 5880
tctgggaacc cattttaaac tggataattg cacaatgttc agatttcctc ttcgtaatgc 5940
agaaatggca aaagtttcgg aaatttcgtc tgttccagca tcagacagaa tggtccagaa 6000
tcttttggac aaactgcgct cagatggggc agaacttcta atgtttctta atcacatgga 6060
aaaaatttct atttgtgaaa tagataagag tactggagct ctaaatgtgc tgtattcagt 6120
aaagggcaaa atcacagatg gagacagatt gaaaaggaaa caatttcatg catctgtaat 6180
```

```
tgatagtgtt actaaaaaga ggcagctcaa agacatacca gttcaacaaa taacctatac 6240
tatggatact gaggactctg aaggaaatct tactacgtgg ctaatttgta atagatcagg 6300
cttttcaagt atggagaaag tatctaaaag tgtcatatca gctcacaaga accaagatat 6360
tactcttttc ccacgtggtg gagtagctgc ctgcattact cacaactata aaaaacccca 6420
tagggccttc tgtttttttgc ctcttttcttt ggagactggg ctgccatttc atgtgaatgg 6480
ccactttgca ctggattcag ccagaaggaa cctgtggcgt gatgataatg gagttggtgt 6540
tcgaagtgac tggaataaca gtttaatgac agcattaata gctcctgcat atgttgaatt 6600
gccaatacag ttaaaaaaac ggtatttccc tggttctgat ccaacattat cagtgttaca 6660
gaacacccct attcatgttg taaaggacac tttaaagaag tttttatcgt ttttcccagt 6720
taaccgtctt gatctacagc cagatttata ttgtctagtg aaagcacttt acaattgcat 6780
tcacgaagac atgaaacgtc ttttacctgt tgtgcgggct ccaaatattg atggctctga 6840
cttgcactct gcagttataa ttacttggat caatatgtct acttctaata aaactagacc 6900
atttttttgac aatttactac aggatgaatt acaacacctt aaaaatgcag attataatat 6960
caccacacgc aaaacagtag cagagaatgt ctataggctg aaacatctcc ttttagaaat 7020
tggtttcaac ttggtttata actgtgatga aactgctaat ctttaccact gtcttataga 7080
tgcagatatt cctgttagtt atgtgacccc tgctgatatc agatcttttt taatgacatt 7140
ttcctctcct gacactaatt gccatattgg gaagctgcct tgtcgtctgc agcagactaa 7200
tctaaaactt tttcatagtt taaaacttttt agttgattat tgttttaaag atgcagaaga 7260
aaatgagatt gaagttgagg gattgcccct tctcatcaca ctggacagtg tttttgcaaac 7320
ttttgatgca aaacgaccca agtttctaac aacatatcat gaattgattc catcccgcaa 7380
agacttgttt atgaatacat tatatttgaa atatagtaat attttattga actgtaaagt 7440
tgcaaaagtg tttgacattt ccagcttgc tgatttgtta tcctctgtgt tgcctcgaga 7500
atataagacc aaaagttgca caaagtggaa agacaatttt gcaagtgagt cttggcttaa 7560
gaatgcatgg cattttatta gtgaatctgt aagtgtgaaa gaagatcagg aagaaacaaa 7620
accaacattt gacattgttg ttgatactct aaaagactgg gcattgcttc caggaacaaa 7680
gtttactgtt tcagccaacc agcttgtggt tcctgaagga gatgttctgc ttcctctcag 7740
ccttatgcac attgcagttt ttccaaatgc ccagagtgat aaagtttttc atgctctaat 7800
gaaagccggc tgtattcagc ttgctttgaa caaaatctgt tccaaagaca gtgcatttgt 7860
tcctttgttg tcatgtcaca cagcaaatat agagagcccc acaagcatct tgaaggctct 7920
acattatatg gtccaaactt caacatttag agcagaaaaa ttagtagaaa atgatttttga 7980
ggcacttttg atgtatttca actgcaattt gaatcatttg atgtcccaag atgatataaa 8040
aattctaaag tcacttccgt gctataaatc catcagtggc cgctatgtaa gcattggaaa 8100
atttggaaca tgctacgtac ttacaaaaag tatcccttca gctgaagtgg agaaatggac 8160
acaatcatca tcatctgcat ttcttgaaga aaaaatacac ttaaaagaac tatatgaggt 8220
gattggttgt gtacctgtag atgatcttga ggtatatttg aaacacctct taccaaaaat 8280
tgaaaatctc tcttatgatg caaaattaga gcacttgatc taccttaaga atagattatc 8340
aagtgctgag gaattatcag agattaagga acaacttttt gaaaaactgg aaagtttatt 8400
gataatccat gatgctaaca gtagactaaa gcaagcaaag catttctatg atagaactgt 8460
gagagttttt gaagttatgc ttcctgaaaa attgtttatt cctaatgatt tctttaagaa 8520
attggaacaa cttataaaac ccaaaaatca tgttacattt atgacatcct gggtggaatt 8580
cttaagaaat attggactaa aatacatact ttctcagcag cagttgttac agtttgctaa 8640
ggaaatcagt gtgagggcta atacagaaaa ctggtccaaa gaaacattgc aaaatacagt 8700
tgatatcctt ctgcatcata tattccaaga acgaatggat ttgttatctg gaaattttct 8760
gaaagaacta tctttaatac cattcttatg tcctgagcgg gcccccgcgg aattcattag 8820
atttcatcct caatatcaag aggtaaatgg aacacttcct cttataaagt tcaatggagc 8880
acaggtaaat ccaaaattca agcaatgtga tgtactccag ctgttatgga catcctgccc 8940
tattcttcca gagaaagcta cacccttaag cattaaagaa caagaaggta gtgaccttgg 9000
tccacaagaa cagcttgaac aagtttttaaa tatgcttaat gttaacctgg atcctcctct 9060
tgataaggta atcaataact gcagaaacat atgcaacata acgacgttgg atgaagaaat 9120
ggtaaaaact agagcaaaag tcttaaggag catatatgaa ttcctcagtg cagaaaaaag 9180
ggaatttcgt tttcagttgc gaggggttgc ttttgtgatg gtagaagatg gttggaaact 9240
tctgaagcct gaggaggtag tcataaacct agaatatgaa tctgattttta aaccttattt 9300
gtacaagcta cctttagaac ttggcacatt tcaccagttg ttcaaacact taggtactga 9360
agatattatt tcaactaagc aatatgttga agtgttgagc cgcatatttta aaaattctga 9420
gggcaaacaa ttagatccta atgaaatgcg tacagttaag agagtagttt ctggtctgtt 9480
caggagtcta cagaatgatt cagtcaaggt gaggagtgat ctcgagaatg tacgagacct 9540
tgcgctttac ctcccaagcc aggatggtag attggtaaag tcaagcatct tagtgtttga 9600
cgatgcgcca cattataaaa gtagaatcca ggggaatatt ggtgtgcaaa tgttagttga 9660
```

```
tctcagccag tgctacttag ggaaagacca tggatttcac actaagttga taatgctctt 9720
tcctcaaaaa cttagacctc gattattgag cagtatactt gaagaacaat tagatgaaga 9780
gactcccaaa gtttgtcagt ttggagcgtt gtgttctctt caaggaagat tgcagttact 9840
cttgtcttct gaacagttca ttacaggact gattagaatt atgaagcatg aaaatgataa 9900
tgctttctg gccaatgaag aaaaagccat aagactttgc aaagccctaa gagaaggatt 9960
gaaagtatcc tgctttgaaa agcttcaaac aacattaaga gttaaaggtt ttaatcctat 10020
tccccacagc agaagtgaaa cttttgcttt tttgaagcga tttggtaatg cagtcatctt 10080
gctctacatt caacattcag acagtaaaga cattaatttc ctgttagcac tggcaatgac 10140
tcttaaatca gcaactgaca atttgatttc tgacacttca tatttaattg ctatgctagg 10200
atgcaatgat atttacagga ttggtgagaa acttgacagt ttaggagtga aatatgactc 10260
ttcggagcca tcaaaactgg aacttccaat gcctggcaca ccaattcctg ctgaaattca 10320
ttacactctg cttatggacc caatgaatgt tttttacccg ggagaatatg ttgggtacct 10380
tgttgatgct gaaggtggtg atatctatgg atcataccag ccaacataca catatgcaat 10440
tattgtacaa gaagttgaaa gagaagatgc tgacaattct agttttctag gaaagatata 10500
tcagatagat attggttata gtgaatataa aatagttagc tctcttgatc tgtataagtt 10560
ttcaagacct gaggaaagct ctcaaagcag ggacagtgct ccttctacac caaccagccc 10620
cactgagttc ctcacccctg gcctgagaag cattcctcct cttttctctg gtagagagag 10680
ccacaagact tcttccaaac atcagtcccc caaaaagctt aaggttaatt ctttaccaga 10740
aatcttaaaa gaagtgacat ctgtggtgga gcaagcatgg aagcttccag aatcggaacg 10800
aaaaaagatt attaggcggt tgtatttgaa atggcatcct gacaaaaatc cagagaacca 10860
tgacattgcc aatgaagttt ttaaacattt gcagaatgaa atcaacagat tagaaaaaca 10920
ggcttttcta gatcaaaatg cagacagggc ctccagacga acattttcaa cctcagcatc 10980
ccgatttcag tcagacaaat actcatttca gagattctat acttcatgga atcaagaagc 11040
aacgagccat aaatctgaaa gacagcaaca gaacaaagaa aaatgccccc cttcagccgg 11100
acagacttac tctcaaaggt tctttgttcc tcccactttc aagtcggttg gcaatccagt 11160
ggaagcacgc agatggctaa gacaagccag agcaaacttc tcagctgcca ggaatgacct 11220
tcataaaaat gccaatgagt gggtgtgctt taaatgttac ctttctacca agttagcttt 11280
gattgcagct gactatgctg tgaggggaaa gtctgataaa gatgtaaaac caactgcact 11340
tgctcagaaa atagaggaat atagtcagca acttgaagga ctgacaaatg atgttcacac 11400
attggaagct tatggtgtag acagtttaaa aacaagatac cctgatttgc ttccctttcc 11460
tcagatccca aatgacaggt tcacttctga ggttgctatg agggtgatgg aatgtactgc 11520
ctgtatcata ataaaacttg aaaattttat gcaacaaaaa gtgtgaagat atttaacgaa 11580
aaaaaaggta gatcttgaat gtgttgtagc acgaataaat tgctgtactt cattaagctt 11640
cattgccaat tagctaggaa ttgttaagca cattgcagat tgttcttgga gaattctgga 11700
gttgttatga acatgaatac caacggaaaa ccttaactga atctaaaaga aaactatttt 11760
gaagatggtg gtgagctgca aaatagctgg atggatttga atgattggga tgatacatca 11820
ttgaactgca ctttatataa ccaaagctta gcagttgtt agataagagt ctatgtatgt 11880
ctctggttag gatgaagtta attttatgtt tttaacatgg tatttttgaa ggagctaatg 11940
aaacactgga catataattg gtttaaacat aaggggaatt aagtctttgt agtctgtcat 12000
ttttttaagt ggatcctctt ggatgcgtta ttttctcatc agctggctct gatcatgaat 12060
ttgttgtaat tttatgttgt actcagtgca tttaagaaat ggtagagtat tttaatccta 12120
ttacttgact aagagtgtga aggtagtact ttttagagtg cactgagtgc actttacatc 12180
tttatttaaa ttttttttta acatcttatg tttacaggct tcctgtttga tgaagatagc 12240
aacggaaaac tcaaaatggt ggcagttctt attaccagtt gttagtattg tttctggaaa 12300
ctgcttgcca agacaacatt tattaactgt tagaacactt gctttatgtt tgtgtgtaca 12360
tattttccac aaatgttata atttatatag tgtggttgaa caggatgcaa tcttttgttg 12420
tctaaaggtg ctgcagttaa aaaaaaaaca accttttctt tcaatatggc atgtagtgga 12480
gttttttaa ctttaaaaac atcaaaaatt gttaaaatca ttgtgttatc tagtagttta 12540
taattatcgg cttatatttc cccatgaatg atcagaactg acatttaatt catgtttgtc 12600
tcgccatgct tctttacttt aacatatttc ttttgcagaa tgtaaaaggt aatgataatt 12660
agtttatata agtgtactgg ctgtaaatga tgctaaatat actttatgca attaagggct 12720
tacagaacat gttgaaactt tttttacttt tattgggaat aaggaatgtt tgcacctcca 12780
catttattg ctt                                                     12793
```

<210> 13
<211> 12717

<212> DNA
<213> Homo sapiens

<400> 13
```
atgaatacat tctggcctgg cagagaattg attgttcaat ggtatccatt tgatgaaaac 60
agaaatcacc catctgtttc atggcttaag atggtttgga aaaatcttta tatacatttt 120
tcagaggatt tgactttatt tgatgagatg ccacttatcc ccagaactat actagaggaa 180
ggtcagacat gtgtggaact cattagactc aggattccat cgttagtcat tttagacgat 240
gaatctgaag cacagcttcc agaattttta gcagacattg tacaaaaact tggagggttt 300
gtccttaaaa aattagatgc atctatacaa catccgctta ttaaaaaata tattcattca 360
ccattaccaa gtgctgtttt gcagataatg gagaagatgc cattgcagaa attgtgtaat 420
caaataactt cgctacttcc aacacacaaa gatgccctga ggaagttctt ggctagttta 480
accgatagca gtgagaaaga gaaaagaatt attcaagaat ggcaatatt caagcgcatt 540
aaccattctt ctgatcaggg aatttcctct tatacaaaat tgaaaggttg taaagtctta 600
caccatactg ccaaactccc agcagatctg cgactttcta tttcagtaat agacagtagt 660
gatgaagcta ctattcgtct ggcaaacatg ttgaaaatag aacagttaaa gaccactagc 720
tgcttaaagc ttgtttttaaa agatattgaa aatgcatttt attcacatga gaggtaaca 780
cagcttatgt tatgggtcct tgagaatcta tcttctctta aaaatgagaa tccaaatgtg 840
cttgagtggt taacaccatt aaaattcatc cagatatcac aggaacagat ggtatcagct 900
ggtgaactct ttgaccctga tatagaagta ctaaaggatc tcttttgtaa tgaagaagga 960
acctatttcc caccctcagt ttttacctca ccagatattc ttcactcctt aagacagatt 1020
ggtttaaaaa acgaagccag tctcaaagaa aaggatgttg tgcaagtggc aaaaaaaatt 1080
gaagccttac aggtcggtgc ttgtcctgat caagatgttc ttctgaagaa agccaaaacc 1140
ctcttactgg tttttaaataa gaatcacaca ctgttgcaat catctgaagg aaagatgaca 1200
ttgaagaaaa taaaatgggt tccagcctgc aaggaaaggc ctccaaatta tccaggctct 1260
ttggtctgga aaggagatct ctgtaatctc tgtgcaccac cagatatgtg tgatgtaggc 1320
catgcaattc tcattggctc ctcacttcct cttgttgaaa gtatccatgt aaacctggaa 1380
aaagcattag ggatcttcac aaaaacctagc cttagtgctg tcttaaaaca cttttaaaatt 1440
gttgttgatt ggtattcttc aaaaacctttt agtgatgaag actactatca attccagcat 1500
attttgcttg agatttacgg attcatgcat gatcatctaa atgaagggaa agattctttt 1560
agagccttaa aatttccatg ggtttggact ggcaaaaagt tttgtccact tgcccaggct 1620
gtgattaaac caatccatga tcttgacctt cagccttatt tgcataatgt acctaaaacc 1680
atggcaaaat tccaccaact atttaaggtc tgtggttcaa tagaggagtt gacatcagat 1740
catatttcca tggttattca gaagatatat ctcaaaagtg accaagatct cagtgaacaa 1800
gaaagcaaac aaaatcttca tcttatgttg aatattatca gatggctgta tagcaatcag 1860
attccagcaa gccccaacac accagttcct atacatcata gcaaaaatcc ttctaaactt 1920
atcatgaagc caattcacga atgctgttat tgtgacatta aagttgatga ccttaatgac 1980
ttacttgaag attctgtgga accaatcatt ttggtgcatg aggacatacc catgaaaact 2040
gcagaatggc taaaagttcc atgccttagt acaagactga taaatcctga aaacatggga 2100
tttgagcagt caggacaaag agagccactt actgtaagaa ttaaaaatat tctggaagaa 2160
tacccttcag tgtcagatat tttttaaagaa ctacttcaaa acgctgatga tgcaaatgca 2220
acagaatgca gtttcttgat tgatatgaga agaaatatgg acataagaga gaatctccta 2280
gacccaggga tggcagcttg tcatggacct gctttgtggt cattcaacaa ttctcaattc 2340
tcagattcag attttgtgaa cataactagg ttaggagaat ctttaaaaag gggagaagtt 2400
gacaaagttg gaaaatttgg tcttggattt aattctgtgt accatatcac tgacattccc 2460
atcattatga gtcgggaatt catgataatg ttcgatccaa acataaatca tatcagtaaa 2520
cacattaaag acaaatccaa tcctgggatc aaaattaatt ggagtaaaca acagaaaaga 2580
cttagaaaat ttcctaatca gttcaaacca tttatagatg tatttggctg tcagttacct 2640
ttgactgtag aagcacctta cagctataat ggaacccttt ccgactgtc ctttagaact 2700
caacaggaag caaaagtgag tgaagttagt agtacgtgct acaatacagc agatatttat 2760
tctcttgtgg atgaatttag tctctgtgga cacaggctta tcattttcac tcagagtgta 2820
aagtcaatgt atttgaagta cttgaaaatt gaggaaacca accccagttt agcacaagat 2880
acagtaataa ttaaaaaaaa atcctgctct tccaaagcat gaacacacc tgtcttaagt 2940
gttttaaaag aggctgctaa gctcatgaag acttgcagca gcagtaataa aaagcttccc 3000
agtgatgaac caaagtcatc ttgcattctt cagatcacag tggaagaatt tcaccatgtg 3060
ttcagaagga ttgctgattt acagtcgcca cttttttagag gtccagatga tgacccagct 3120
gctctctttg aaatggctaa gtctggccaa tcaaaaaagc catcagatga gttgtcacag 3180
aaaacagtag agtgtaccac gtggcttctg tgtacttgca tggacacagg agaggctctg 3240
```

```
aagttttccc tgagtgagag tggaagaaga ctaggactgg ttccatgtgg ggcagtagga 3300
gttcagctgt cagaaatcca ggaccagaag tggacagtga aaccacacat tggagaggtg 3360
ttttgctatt tacctttacg aataaaaaca ggcttgccag ttcatatcaa tgggtgcttt 3420
gctgttacat caaataggaa agaaatctgg aaaacagata caaaaggacg atggaatacc 3480
acgttcatga gacatgttat tgtgaaagct tacttacagg tactgagtgt cttacgggac 3540
ctggccacta gtggggagct aatggattat acttactatg cagtatggcc cgatcctgat 3600
ttagttcatg atgatttttc tgtaatttgc caaggatttt atgaagatat agctcatgga 3660
aaagggaaag aactgaccaa agtcttctct gatggatcta cttgggtttc catgaagaac 3720
gtaagatttc tagatgactc tatacttaaa agaagagatg ttggttcagc agccttcaag 3780
atatttttga aatacctcaa gaagactggg tccaaaaacc tttgtgctgt tgaacttcct 3840
tcttcggtaa aattaggatt tgaagaagct ggctgcaaac agatactact tgaaaacaca 3900
ttttcagaga aacagttttt ttctgaagtg ttttttccaa atattcaaga aattgaagca 3960
gaacttagag atcctttaat gatctttgtt ctaaatgaaa aagttgatga gttctcggga 4020
gttcttcgtg ttactccatg tattccttgt tccttggagg ggcatccttt ggttttgcca 4080
tcaagattga tccacccga aggacgagtt gcaaagttat ttgatattaa agatgggaga 4140
ttcccttatg gttctactca ggattatctc aatcctatta tttttgattaa actagttcag 4200
ttaggtatgg caaaagatga tattttatgg gatgatatgc tagaacgtgc agtgtcagta 4260
gctgaaatta ataaaagtga tcatgttgct gcatgcctaa gaagtagtat cttattgagt 4320
cttatcgatg agaaactaaa aataagggat cctagagcaa aggattttgc tgcaaaatat 4380
caaacaatcc gcttccttcc atttctgaca aaaccagcag gttttcttt ggactggaaa 4440
ggcaacagtt ttaagcctga aaccatgttt gcagcaactg acctttatac agctgaacat 4500
caagatatag tttgtctttt gcaaccaatt ctaaatgaaa attcccattc ttttagaggt 4560
tgtggttcag tgtcattggc tgttaaagag ttttgtgggat tactcaagaa gccaacagtt 4620
gatctggtta taaaccaatt gaaagaagta gcaaaatcag ttgatgatgg aattacactg 4680
taccaggaga atatcaccaa tgcttgctac aaataccttc atgaagcctt gatgcaaaat 4740
gaaatcacta agatgtcaat tattgataag ttaaaaccct ttagcttcat tctagttgag 4800
aatgcatatg ttgactcaga aaaggtttct tttcatttaa attttgaggc ggcaccatac 4860
ctttatcagt tgcctaataa gtataaaaat aatttccgcg aacttttttga aaccgtgggt 4920
gtgaggcagt catgcactgt tgaagatttt gctcttgttt tggaatctat tgatcaagaa 4980
agaggaacaa agcaaataac agaagagaat tttcagcttt gccgacgaat aatcagtgaa 5040
ggaatatgga gtctcattag agaaaagaaa caagaatttt gtgagaaaaa ttatggcaag 5100
atattattgc cagatactaa tcttatgctt ctccctgcta aatcgttatg ctacaatgat 5160
tgcccttgga taaaagtaaa ggataccact gtaaaatatt gtcatgctga cataccagg 5220
gaagtagcag taaaactagg agcagtccca aagcgacaca aagccttaga aagatatgca 5280
tccaatgtct gttttacaac acttggcaca gaatttgggc agaaagaaaa attgaccagc 5340
agaattaaga gcatccttaa tgcatatcct tctgaaaagg aaatgttgaa agagcttctt 5400
caaaatgctg atgatgcaaa ggcgacagaa atctgttttg tgtttgatcc tagacagcat 5460
ccagttgata gaatatttga tgataagtgg gccccattgc aagggccagc actttgtgtg 5520
tacaacaacc agccatttac agaagatgat gttagaggaa ttcagaatct tggaaaaggc 5580
acgaaagagg gaaatcctta taaaactgga cagtatggaa taggattcaa ttctgtgtat 5640
catatcacag actgcccatc tttttatttct ggcaatgaca tcctgtgtat ttttgatcct 5700
catgccagat atgcaccagg ggccacatcc attagtcccg gacgcatgtt tagagatttg 5760
gatgcagatt ttaggacaca gttctcagat gttctggatc tttatctggg aacccatttt 5820
aaactggata attgcacaat gttcagattt cctcttcgta atgcagaaat ggcaaagtt 5880
tcggaaattt cgtctgttcc agcatcagac agaatggtcc agaatctttt ggacaaactg 5940
cgctcagatg gggcagaact tctaatgttt cttaatcaca tggaaaaaat ttctatttgt 6000
gaaatagata agagtactgg agctctaaat gtgctgtatt cagtaaaggg caaaatcaca 6060
gatggagaca gattgaaaag gaaacaattt catgcatctg taattgatag tgttactaaa 6120
aagaggcagc tcaaagacat accagttcaa caaataacct atactatgga tactgaggac 6180
tctgaaggaa atcttactac gtggctaatt tgtaatagat caggctttttc aagtatggag 6240
aaagtatcta aaagtgtcat atcagctcac aagaaccaag atattactct ttttcccacgt 6300
ggtggagtag ctgcctgcat tactcacaac tataaaaaac cccatagggc cttctgtttt 6360
ttgcctcttt ctttggagac tgggctgcca tttcatgtga atggccactt tgcactggat 6420
tcagccagaa ggaacctgtg gcgtgatgat aatggagttg gtgttcgaag tgactggaat 6480
aacagtttaa tgacagcatt aatagctcct gcatatgttg aattgctaat acagttaaaa 6540
aaacggtatt tccctggttc tgatccaaca ttatcagtgt tacagaacac ccctattcat 6600
gttgtaaagg acactttaaa gaagttttta tcgttttcc cagttaaccg tcttgatcta 6660
cagccagatt tatattgtct agtgaaagca ctttacaatt gcattcacga agacatgaaa 6720
```

```
cgtctttttac ctgttgtgcg ggctccaaat attgatggct ctgacttgca ctctgcagtt 6780
ataattactt ggatcaatat gtctacttct aataaaacta gaccatttttt tgacaatttta 6840
ctacaggatg aattacaaca ccttaaaaat gcagattata atatcaccac acgcaaaaca 6900
gtagcagaga atgtctatag gctgaaacat ctcctttttag aaattggttt caacttggtt 6960
tataactgtg atgaaactgc taatctttac cactgtctta tagatgcaga tattcctgtt 7020
agttatgtga cccctgctga tatcagatct tttttaatga cattttcctc tcctgacact 7080
aattgccata ttgggaagct gccttgtcgt ctgcagcaga ctaatctaaa acttttttcat 7140
agtttaaaac ttttagttga ttattgtttt aaagatgcag aagaaaatga gattgaagtt 7200
gagggattgc cccttctcat cacactggac agtgttttgc aaacttttga tgcaaaacga 7260
cccaagtttc taacaacata tcatgaattg attccatccc gcaaagactt gtttatgaat 7320
acattatatt tgaaatatag taatatttta ttgaactgta aagttgcaaa agtgtttgac 7380
atttccagct ttgctgattt gttatcctct gtgttgcctc gagaatataa gaccaaaagt 7440
tgcacaaagt ggaaagacaa ttttgcaagt gagtcttggc ttaagaatgc atggcatttt 7500
attagtgaat ctgtaagtgt gaaagaagat caggaagaaa caaaaccaac atttgacatt 7560
gttgttgata ctctaaaaga ctgggcattg cttccaggaa caaagtttac tgtttcagcc 7620
aaccagcttg tggttcctga aggagatgtt ctgcttcctc tcagccttat gcacattgca 7680
gtttttccaa atgcccagag tgataaagtt tttcatgctc taatgaaagc tggctgtatt 7740
cagcttgctt tgaacaaaat ctgttccaaa gacagtgcat ttgttcctttt gttgtcatgt 7800
cacacagcaa atatagagag ccccacaagc atcttgaagg ctctacatta tatggtccaa 7860
acttcaacat ttagagcaga aaaattagta gaaaatgatt ttgaggcact tttgatgtat 7920
ttcaactgca atttgaatca tttgatgtcc caagatgata taaaaattct aaagtcactt 7980
ccgtgctata aatccatcag tggccgctat gtaagcattg gaaaatttgg aacatgctac 8040
gtacttacaa aaagtatccc ttcagctgaa gtggagaaat ggacacaatc atcatcatct 8100
gcatttcttg aagaaaaaat acacttaaaa gaactatatg aggtgattgg ttgtgtacct 8160
gtagatgatc ttgaggtata tttgaaacac ctcttaccaa aaattgaaaa tctctcttat 8220
gatgcaaaat tagagcactt gatctacctt aagaatagat tatcaagtgc tgaggaatta 8280
tcagagatta aggaacaact ttttgaaaaa ctggaaagtt tattgataat ccatgatgct 8340
aacagtagac taaagcaagc aaagcatttc tatgatagaa ctgtgagagt ttttgaagtt 8400
atgcttcctg aaaaattgtt tattcctaat gatttcttta agaaattgga acaacttata 8460
aaacccaaaa atcatgttac atttatgaca tcctgggtgg aattcttaag aaatattgga 8520
ctaaaataca tactttctca gcagcagttg ttacagtttg ctaaggaaat cagtgtgagg 8580
gctaatacag aaaactggtc caaagaaaca ttgcaaaata cagttgatat ccttctgcat 8640
catatattcc aagaacgaat ggatttgtta tctggaaatt ttctgaaaga actatcttta 8700
ataccattct tatgtcctga gcgggccccc gcggaattca ttagatttca tcctcaatat 8760
caagaggtaa atggaacact tcctcttata aagttcaatg gagcacaggt aaatccaaaa 8820
ttcaagcaat gtgatgtact ccagctgtta tggacatcct gccctattct tccagagaaa 8880
gctacaccct taagcattaa agaacaagaa ggtagtgacc ttggtccaca agaacagctt 8940
gaacaagttt taaatatgct taatgttaac ctggatcctc tcttgataa ggtaatcaat 9000
aactgcagaa acatatgcaa cataacgacg ttggatgaag aaatggtaaa aactagagca 9060
aaagtcttaa ggagcatata tgaattcctc agtgcagaaa aagggaatt tcgttttcag 9120
ttgcgagggg ttgctttttgt gatggtagaa gatggttgga aacttctgaa gcctgaggag 9180
gtagtcataa acctagaata tgaatctgat tttaaacctt atttgtacaa gctacctttta 9240
gaacttggca catttcacca gttgttcaaa cacttaggta ctgaagatat tatttcaact 9300
aagcaatatg ttgaagtgtt gagccgcata tttaaaaatt ctgagggcaa acaattagat 9360
cctaatgaaa tgcgtacagt taagagagta gtttctggtc tgttcaggag tctacagaat 9420
gattcagtca aggtgaggag tgatctcgag aatgtacgag accttgcgct ttacctccca 9480
agccaggatg gtagattggt aaagtcaagc atcttagtgt ttgacgatgc gccacattat 9540
aaaagtagaa tccaggggaa tattggtgtg caaatgttag ttgatctcag ccagtgctac 9600
ttagggaaag accatggatt tcacactaag ttgataatgc tctttcctca aaaacttaga 9660
cctcgattat tgagcagtat acttgaagaa caattagatg aagagactcc caagtttgt 9720
cagtttggag cgttgtgttc tcttcaagga agattgcagt tactcttgtc ttctgaacag 9780
ttcattacag gactgattag aattatgaag catgaaaatg ataatgcttt tctggccaat 9840
gaagaaaaag ccataagact ttgcaaagcc ctaagagaag gattgaaagt atcctgcttt 9900
gaaaagcttc aaacaacatt aagagttaaa ggtttttaatc ctattcccca cagcagaagt 9960
gaaacttttg cttttttgaa gcgatttggt aatgcagtca tcttgctcta cattcaacat 10020
tcagacagta aagacattaa tttcctgtta gcactggcaa tgactcttaa atcagcaact 10080
gacaatttga tttctgacac ttcatattta attgctatgc taggatgcaa tgatatttac 10140
aggattggtg agaaacttga cagtttagga gtgaaatatg actcttcgga gccatcaaaa 10200
```

```
ctggaacttc caatgcctgg cacaccaatt cctgctgaaa ttcattacac tctgcttatg 10260
gacccaatga atgttttta cccgggagaa tatgttgggt accttgttga tgctgaaggt 10320
ggtgatatct atggatcata ccagccaaca tacacatatg caattattgt acaagaagtt 10380
gaaagagaag atgctgacaa ttctagtttt ctaggaaaga tatatcagat agatattggt 10440
tatagtgaat ataaaatagt tagctctctt gatctgtata agttttcaag acctgaggaa 10500
agctctcaaa gcagggacag tgctccttct acaccaacca gccccactga gttcctcacc 10560
cctggcctga gaagcattcc tcctcttttc tctggtagag agagccacaa gacttcttcc 10620
aaacatcagt cccccaaaaa gcttaaggtt aattctttac cagaaatctt aaaagaagtg 10680
acatctgtgg tggagcaagc atggaagctt ccagaatcgg aacgaaaaaa gattattagg 10740
cggttgtatt tgaaatggca tcctgacaaa aatccagaga accatgacat tgccaatgaa 10800
gttttaaac atttgcagaa tgaaatcaac agattagaaa aacaggcttt tctagatcaa 10860
aatgcagaca gggcctccag acgaacattt tcaacctcag catcccgatt tcagtcagac 10920
aaatactcat ttcagagatt ctatacttca tggaatcaag aagcaacgag ccataaatct 10980
gaaagacagc aacagaacaa agaaaaatgc ccccctttcag ccggacagac ttactctcaa 11040
aggttctttg ttcctcccac tttcaagtcg gttggcaatc cagtggaagc acgcagatgg 11100
ctaagacaag ccagagcaaa cttctcagct gccaggaatg accttcataa aaatgccaat 11160
gagtgggtgt gctttaaatg ttacctttct accaagttag ctttgattgc agctgactat 11220
gctgtgaggg gaaagtctga taaagatgta aaaccaactg cacttgctca gaaaatagag 11280
gaatatagtc agcaacttga aggactgaca aatgatgttc acacattgga agcttatggt 11340
gtagacagtt taaaaacaag ataccctgat ttgcttccct ttcctcagat cccaaatgac 11400
aggttcactt ctgaggttgc tatgagggtg atggaatgta ctgcctgtat cataataaaa 11460
cttgaaaatt ttatgcaaca aaaagtgtga agatatttaa cgaaaaaaaa ggtagatctt 11520
gaatgtgttg tagcacgaat aaattgctgt acttcattaa gcttcattgc caattagcta 11580
ggaattgtta agcacattgc agattgttct tggagaattc tggagttgtt atgaacatga 11640
ataccaacgg aaaaccttaa ctgaatctaa aagaaaacta ttttgaagat ggtggtgagc 11700
tgcaaaatag ctggatggat ttgaatgatt gggatgatac atcattgaac tgcactttat 11760
ataaccaaag cttagcagtt tgttagataa gagtctatgt atgtctctgg ttaggatgaa 11820
gttaatttta tgttttaac atggtatttt tgaaggagct aatgaaacac tggacatata 11880
attggtttaa acataagggg aattaagtct ttgtagtctg tcattttttt aagtggatcc 11940
tcttggatgc gttattttct catcagctgg ctctgatcat gaatttgttg taatttttatg 12000
ttgtactcag tgcatttaag aaatggtaga gtattttaat cctattactt gactaagagt 12060
gtgaaggtag tactttttag agtgcactga gtgcacttta catctttatt taaatttttt 12120
tttaacatct tatgtttaca ggcttcctgt ttgatgaaga tagcaacgga aaactcaaaa 12180
tggtggcagt tcttattacc agttgttagt attgtttctg gaaactgctt gccaagacaa 12240
catttattaa ctgttagaac acttgcttta tgtttgtgtg tacatatttt ccacaaatgt 12300
tataatttat atagtgtggt tgaacaggat gcaatctttt gttgtctaaa ggtgctgcag 12360
ttaaaaaaaa aacaaccttt tctttcaata tggcatgtag tggagttttt ttaactttaa 12420
aaacatcaaa aattgttaaa atcattgtgt tatctagtag tttataatta tcggcttata 12480
tttccccatg aatgatcaga actgacattt aattcatgtt tgtctcgcca tgcttcttta 12540
ctttaacata tttcttttgc agaatgtaaa aggtaatgat aattagttta tataagtgta 12600
ctggctgtaa atgatgctaa atatacttta tgcaattaag ggcttacaga acatgttgaa 12660
actttttta cttttattgg gaataaggaa tgtttgcacc tccacatttt attgctt     12717
```

<210> 14
<211> 12717
<212> DNA
<213> Homo sapiens

<400> 14
```
atgaatacat tctggcctgg cagagaattg attgttcaat ggtatccatt tgatgaaaac 60
agaaatcacc catctgtttc atggcttaag atggtttgga aaaatcttta tatacatttt 120
tcagaggatt tgactttatt tgatgagatg ccacttatcc ccagaactat actagaggaa 180
ggtcagacat gtgtggaact cattagactc aggattccat cgttagtcat tttagacgat 240
gaatctgaag cacagcttcc agaattttta gcagacattg tacaaaaact tggagggttt 300
gtccttaaaa aattagatgc atctatacaa catccgctta ttaaaaaata tattcattca 360
ccattaccaa gtgctgtttt gcagataatg gagaagatgc cattgcagaa attgtgtaat 420
```

```
caaataactt cgctacttcc aacacacaaa gatgccctga ggaagttctt ggctagttta 480
accgatagca gtgagaaaga gaaaagaatt attcaagaat tggcaatatt caagcgcatt 540
aaccattctt ctgatcaggg aatttcctct tatacaaaat tgaaaggttg taaagtctta 600
caccatactg ccaaactccc agcagatctg cgactttcta tttcagtaat agacagtagt 660
gatgaagcta ctattcgtct ggcaaacatg ttgaaaatag aacagttaaa gaccactagc 720
tgcttaaagc ttgtttaaaa agatattgaa aatgcatttt attcacatga agaggtaaca 780
cagcttatgt tatgggtcct tgagaatcta tcttctctta aaaatgagaa tccaaatgtg 840
cttgagtggt taacaccatt aaaattcatc cagatatcac aggaacagat ggtatcagct 900
ggtgaactct ttgaccctga tatagaagta ctaaaggatc tcttttgtaa tgaagaagga 960
acctatttcc caccctcagt ttttacctca ccagatattc ttcactcctt aagacagatt 1020
ggtttaaaaa acgaagccag tctcaaagaa aaggatgttg tgcaagtggc aaaaaaaatt 1080
gaagccttac aggtcggtgc ttgtcctgat caagatgttc ttctgaagaa agccaaaacc 1140
ctcttactgg ttttaaataa gaatcacaca ctgttgcaat catctgaagg aaagatgaca 1200
ttgaagaaaa taaaatgggt tccagcctgc aaggaaaggc ctccaaatta tccaggctct 1260
ttggtctgga aaggagatct ctgtaatctc tgtgcaccac cagatatgtg tgatgtaggc 1320
catgcaattc tcattggctc ctcacttcct cttgttgaaa gtatccatgt aaacctggaa 1380
aaagcattag ggatcttcac aaaaacctagc cttagtgctg tcttaaaaca ctttaaaatt 1440
gttgttgatt ggtattcttc aaaaaccttt agtgatgaag actactatca attccagcat 1500
attttgcttg agatttacgg attcatgcat gatcatctaa atgaagggaa agattctttt 1560
agagccttaa aatttccatg ggtttggact ggcaaaaagt tttgtccact tgcccaggct 1620
gtgattaaac caatccatga tcttgacctt cagccttatt tgcataatgt acctaaaacc 1680
atggcaaaat tccaccaact atttaaggtc tgtggttcaa tagaggagtt gacatcagat 1740
catatttcca tggttattca gaagatatat ctcaaaagtg accaagatct cagtgaacaa 1800
gaaagcaaac aaaaatcttca tcttatgttg aatattatca gatggctgta tagcaatcag 1860
attccagcaa gccccaacac accagttcct atacatcata gcaaaaatcc ttctaaactt 1920
atcatgaagc caattcacga atgctgttat tgtgacatta aagttgatga ccttaatgac 1980
ttacttgaag attctgtgga accaatcatt ttggtgcatg aggacatacc catgaaaact 2040
gcagaatggc taaaagttcc atgccttagt acaagactga taaatcctga aaacatggga 2100
tttgagcagt caggacaaag agagccactt actgtaagaa ttaaaaatat tctggaagaa 2160
tacccttcag tgtcagatat ttttaaagaa ctacttcaaa acgctgatga tgcaaatgca 2220
acagaatgca gtttcttgat tgatatgaga agaaatatgg acataagaga gaatctccta 2280
gacccaggga tggcagcttg tcatggacct gctttgtggt cattcaacaa ttctcaattc 2340
tcagattcag attttgtgaa cataactagg ttaggagaat ctttaaaaag gggagaagtt 2400
gacaaagttg gaaaatttgg tcttggattt aattctgtgt accatatcac tgacattccc 2460
atcattatga gtcgggaatt catgataatg ttcgatccaa acataaatca tatcagtaaa 2520
cacattaaag acaaatccaa tcctgggatc aaaattaatt ggagtaaaca acagaaaaga 2580
cttagaaaat ttcctaatca gttcaaacca tttatagatg tatttggctg tcagttacct 2640
ttgactgtag aagcacctta cagctataat ggaacccttt tccgactgtc ctttagaact 2700
caacaggaag caaaagtgag tgaagttagt agtacgtgct acaatacagc agatatttat 2760
tctcttgtgg atgaatttag tctctgtgga cacaggctta tcattttcac tcagagtgta 2820
aagtcaatgt atttgaagta cttgaaaatt gaggaaacca accccagttt agcacaagat 2880
acagtaataa ttaaaaaaaa atcctgctct tccaaagcat tgaacacacc tgtcttaagt 2940
gttttaaaag aggctgctaa gctcatgaag acttgcagca gcagtaataa aaagcttccc 3000
agtgatgaac caaagtcatc ttgcattctt cagatcacag tggaagaatt tcaccatgtg 3060
ttcagaagga ttgctgattt acagtcgcca ctttttagag gtccagatga tgacccagct 3120
gctctctttg aaatggctaa gtctggccaa tcaaaaaagc catcagatga gttgtcacag 3180
aaaacagtag agtgtaccac gtggcttctg tgtacttgca tggacacagg agaggctctg 3240
aagttttccc tgagtgagag tggaagaaga ctaggactgg ttccatgtgg ggcagtagga 3300
gttcagctgt cagaaatcca ggaccagaag tggacagtga aaccacacat tggagaggtg 3360
ttttgctatt tacctttacg aataaaaaca ggcttgccag ttcatatcaa tgggtgcttt 3420
gctgttacat caaataggaa agaaatctgg aaaacagata caaaaggacg atggaatacc 3480
acgttcatga gacatgttat tgtgaaagct tacttacagg tactgagtgt cttacgggac 3540
ctggccacta gtggggagct aatggattat acttactatg cagtatggcc cgatcctgat 3600
ttagttcatg atgattttc tgtaatttgc caaggatttt atgaagatat agctcatgga 3660
aaagggaaag aactgaccaa agtcttctct gatggatcta cttgggtttc catgaagaac 3720
gtaagatttc tagatgactc tatacttaaa agaagagatg ttggttcagc agccttcaag 3780
atattttga aatacctcaa gaagactggg tccaaaaacc tttgtgctgt tgaacttcct 3840
tcttcggtaa aattaggatt tgaagaagct ggctgcaaac agatactact tgaaaacaca 3900
```

```
ttttcagaga aacagttttt ttctgaagtg ttttttccaa atattcaaga aattgaagca 3960
gaacttagag atcctttaat gatctttgtt ctaaatgaaa aagttgatga gttctcggga 4020
gttcttcgtg ttactccatg tattccttgt tccttggagg ggcatccttt ggttttgcca 4080
tcaagattga tccaccccga aggacgagtt gcaaagttat ttgatattaa agatgggaga 4140
ttcccttatg gttctactca ggattatctc aatcctatta ttttgattaa actagttcag 4200
ttaggtatgg caaaagatga tattttatgg gatgatatgc tagaacgtgc agtgtcagta 4260
gctgaaatta ataaaagtga tcatgttgct gcatgcctaa gaagtagtat cttattgagt 4320
cttatcgatg agaaactaaa aataagggat cctagagcaa aggattttgc tgcaaaatat 4380
caaacaatcc gcttccttcc atttctgaca aaaccagcag gttttctttt ggactggaaa 4440
ggcaacagtt ttaagcctga aaccatgttt gcagcaactg acctttatac agctgaacat 4500
caagatatag tttgtctttt gcaaccaatt ctaaatgaaa attcccattc ttttagaggt 4560
tgtggttcag tgtcattggc tgttaaagag ttttgtgggat tactcaagaa gccaacagtt 4620
gatctggtta taaaccaatt gaaagaagta gcaaaatcag ttgatgatgg aattacactg 4680
taccaggaga atatcaccaa tgcttgctac aaataccttc atgaagcctt gatgcaaaat 4740
gaaatcacta agatgtcaat tattgataag ttaaaaccct ttagcttcat tctagttgag 4800
aatgcatatg ttgactcaga aaaggtttct tttcatttaa attttgaggc ggcaccatac 4860
ctttatcagt tgcctaataa gtataaaaat aatttccgcg aactttttga aaccgtgggt 4920
gtgaggcagt catgcactgt tgaagatttt gctcttgttt tggaatctat tgatcaagaa 4980
agaggaacaa agcaaataac agaagagaat tttcagcttt gccgacgaat aatcagtgaa 5040
ggaatatgga gtctcattag agaaaagaaa caagaatttt gtgagaaaaa ttatggcaag 5100
atattattgc cagatactaa tcttatgctt ctccctgcta aatcgttatg ctacaatgat 5160
tgcccttgga taaaagtaaa ggataccact gtaaaatatt gtcatgctga catacccagg 5220
gaagtagcag taaaactagg agcagtccca aagcgacaca aagccttaga aagatatgca 5280
tccaatgtct gttttacaac acttggcaca gaatttgggc agaaagaaaa attgaccagc 5340
agaattaaga gcatccttaa tgcatatcct tctgaaaagg aaatgttgaa agagcttctt 5400
caaaatgctg atgatgcaaa ggcgacagaa atctgttttg tgtttgatcc tagacagcat 5460
ccagttgata gaatatttga tgataagtgg gccccattgc aagggccagc actttgtgtg 5520
tacaacaacc agccatttac agaagatgat gttagaggaa ttcagaatct tggaaaaggc 5580
acgaaagagg gaaatcctta taaaactgga cagtatggaa taggattcaa ttctgtgtat 5640
catatcacag actgcccatc ttttatttct ggcaatgaca tcctgtgtat ttttgatcct 5700
catgccagat atgcaccagg ggccacatcc attagtcccg gacgcatgtt tagagatttg 5760
gatgcagatt ttaggacaca gttctcagat gttctggatc tttatctggg aacccatttt 5820
aaactggata attgcacaat gttcagattt cctcttcgta atgcagaaat ggcaaagtt 5880
tcggaaattt cgtctgttcc agcatcagac agaatggtcc agaatctttt ggacaaactg 5940
cgctcagatg gggcagaact tctaatgttt cttaatcaca tggaaaaaat ttctatttgt 6000
gaaatagata agagtactgg agctctaaat gtgctgtatt cagtaaaggg caaaatcaca 6060
gatggagaca gattgaaaag gaaacaattt catgcatctg taattgatag tgttactaaa 6120
aagaggcagc tcaaagacat accagttcaa caaataacct atactatgga tactgaggac 6180
tctgaaggaa atcttactac gtggctaatt tgtaatagat caggcttttc aagtatggag 6240
aaagtatcta aaagtgtcat atcagctcac aagaaccaag atattactct tttcccacgt 6300
ggtggagtag ctgcctgcat tactcacaac tataaaaaac cccataggge cttctgtttt 6360
ttgcctcttt ctttggagac tgggctgcca tttcatgtga atggccactt tgcactggat 6420
tcagccagaa ggaacctgtg gcgtgatgat aatggagttg gtgttcgaag tgactggaat 6480
aacagtttaa tgacagcatt aatagctcct gcatatgttg aattgctaat acagtaaaaa 6540
aaacggtatt tccctggttc tgatccaaca ttatcagtgt tacagaacac ccctattcat 6600
gttgtaaagg acactttaaa gaagttttta tcgttttttcc cagttaaccg tcttgatcta 6660
cagccagatt tatattgtct agtgaaagca ctttacaatt gcattcacga agacatgaaa 6720
cgtctttttac ctgttgtgcg ggctccaaat attgatggct ctgacttgca ctctgcagtt 6780
ataattactt ggatcaatat gtctacttct aataaaacta gaccattttt tgacaattta 6840
ctacaggatg aattacaaca ccttaaaaat gcagattata atatcaccac acgcaaaaca 6900
gtagcagaga atgtctatag gctgaaacat ctccttttag aaattggttt caacttggtt 6960
tataactgtg atgaaactgc taatctttac cactgtctta tagatgcaga tattcctgtt 7020
agttatgtga cccctgctga tatcagatct tttttaatga cattttcctc tcctgacact 7080
aattgccata ttgggaagct gccttgtcgt ctgcagcaga ctaatctaaa acttttttcat 7140
agtttaaaac ttttagttga ttattgtttt aaagatgcag aagaaatga gattgaagtt 7200
gagggattgc cccttctcat cacactggac agtgttttgc aaactttga tgcaaaacga 7260
cccaagtttc taacaacata tcatgaattg attccatccc gcaaagactt gtttatgaat 7320
acattatatt tgaaatatag taatatttta ttgaactgta aagttgcaaa agtgtttgac 7380
```

```
atttccagct ttgctgattt gttatcctct gtgttgcctc gagaatataa gaccaaaagt 7440
tgcacaaagt ggaaagacaa ttttgcaagt gagtcttggc ttaagaatgc atggcatttt 7500
attagtgaat ctgtaagtgt gaaagaagat caggaagaaa caaaaccaac atttgacatt 7560
gttgttgata ctctaaaaga ctgggcattg cttccaggaa caaagtttac tgtttcagcc 7620
aaccagcttg tggttcctga aggagatgtt ctgcttcctc tcagccttat gcacattgca 7680
gtttttccaa atgcccagag tgataaagtt tttcatgctc taatgaaagc cggctgtatt 7740
cagcttgctt tgaacaaaat ctgttccaaa gacagtgcat ttgttccttt gttgtcatgt 7800
cacacagcaa atatagagag ccccacaagc atcttgaagg ctctacatta tatggtccaa 7860
acttcaacat ttagagcaga aaaattagta gaaaatgatt ttgaggcact tttgatgtat 7920
ttcaactgca atttgaatca tttgatgtcc caagatgata taaaaattct aaagtcactt 7980
ccgtgctata aatccatcag tggccgctat gtaagcattg gaaaatttgg aacatgctac 8040
gtacttacaa aaagtatccc ttcagctgaa gtggagaaat ggacacaatc atcatcatct 8100
gcatttcttg aagaaaaaat acacttaaaa gaactatatg aggtgattgg ttgtgtacct 8160
gtagatgatc ttgaggtata tttgaaacac ctcttaccaa aaattgaaaa tctctcttat 8220
gatgcaaaat tagagcactt gatctacctt aagaatagat tatcaagtgc tgaggaatta 8280
tcagagatta aggaacaact ttttgaaaaa ctggaaagtt tattgataat ccatgatgct 8340
aacagtagac taaagcaagc aaagcatttc tatgatagaa ctgtgagagt ttttgaagtt 8400
atgcttcctg aaaaattgtt tattcctaat gatttcttta agaaattgga acaacttata 8460
aaacccaaaa atcatgttac atttatgaca tcctgggtgg aattcttaag aaatattgga 8520
ctaaaataca tactttctca gcagcagttg ttacagtttg ctaaggaaat cagtgtgagg 8580
gctaatacag aaaactggtc caaagaaaca ttgcaaaata cagttgatat ccttctgcat 8640
catatattcc aagaacgaat ggatttgtta tctggaaatt ttctgaaaga actatcttta 8700
ataccattct tatgtcctga gcgggccccc gcggaattca ttagatttca tcctcaatat 8760
caagaggtaa atggaacact tcctcttata aagttcaatg gagcacaggt aaatccaaaa 8820
ttcaagcaat gtgatgtact ccagctgtta tggacatcct gccctattct tccagagaaa 8880
gctacaccct taagcattaa agaacaagaa ggtagtgacc ttggtccaca agaacagctt 8940
gaacaagttt taaatatgct taatgttaac ctggatcctc ctcttgataa ggtaatcaat 9000
aactgcagaa acatatgcaa cataacgacg ttggatgaag aaatggtaaa aactagagca 9060
aaagtcttaa ggagcatata tgaattcctc agtgcagaaa aaagggaatt tcgttttcag 9120
ttgcgagggg ttgcttttgt gatggtagaa gatggttgga aacttctgaa gcctgaggag 9180
gtagtcataa acctagaata tgaatctgat tttaaacctt atttgtacaa gctaccttta 9240
gaacttggca catttcacca gttgttgaaa cacttaggta ctgaagatat tatttcaact 9300
aagcaatatg ttgaagtgtt gagccgcata tttaaaaatt ctgagggcaa acaattagat 9360
cctaatgaaa tgcgtacagt taagagagta gtttctggtc tgttcaggag tctacagaat 9420
gattcagtca aggtgaggag tgatctcgag aatgtacgag accttgcgct ttacctccca 9480
agccaggatg gtagattggt aaagtcaagc atcttagtgt ttgacgatgc gccacattat 9540
aaaagtagaa tccaggggaa tattggtgtg caaatgttag ttgatctcag ccagtgctac 9600
ttagggaaag accatggatt tcacactaag ttgataatgc tctttcctca aaaacttaga 9660
cctcgattat tgagcagtat acttgaagaa caattagatg aagagactcc caaagtttgt 9720
cagtttggag cgttgtgttc tcttcaagga agattgcagt tactcttgtc ttctgaacag 9780
ttcattacag gactgattag aattatgaag catgaaaatg ataatgcttt tctggccaat 9840
gaagaaaaag ccataagact ttgcaaagcc ctaagagaag gattgaaagt atcctgcttt 9900
gaaaagcttc aaacaacatt aagagttaaa ggttttaatc ctattcccca cagcagaagt 9960
gaaacttttg cttttttgaa gcgatttggt aatgcagtca tcttgctcta cattcaacat 10020
tcagacagta aagacattaa tttcctgtta gcattggcaa tgactcttaa atcagcaact 10080
gacaatttga tttctgacac ttcatattta attgctatgc taggatgcaa tgatatttac 10140
aggattggtg agaaattga cagtttagga gtgaaatatg actcttcgga gccatcaaaa 10200
ctggaacttc caatgcctgg cacaccaatt cctgctgaaa ttcattacac tctgcttatg 10260
gacccaatga atgttttta cccgggagaa tatgttgggt accttgttga tgctgaaggt 10320
ggtgatatct atggatcata ccagccaaca tacacatatg caattattgt acaagaagtt 10380
gaaagagaag atgctgacaa ttctagtttt ctaggaaaga tatatcagat agatattggt 10440
tatagtgaat ataaaatagt tagctctctt gatctgtata agttttcaag acctgaggaa 10500
agctctcaaa gcagggacag tgctccttct acaccaacca gccccactga gttcctcacc 10560
cctggcctga gaagcattcc tcctcttttc tctggtagag agagccacaa gacttcttcc 10620
aaacatcagt cccccaaaaa gcttaaggtt aattctttac cagaaatctt aaaagaagtg 10680
acatctgtgg tggagcaagc atggaagctt ccagaatcgg aacgaaaaaa gattattagg 10740
cggttgtatt tgaaatggca tcctgacaaa aatccagaga accatgacat tgccaatgaa 10800
gttttaaac atttgcagaa tgaaatcaac agattagaaa aacaggcttt tctagatcaa 10860
```

```
aatgcagaca gggcctccag acgaacattt tcaacctcag catcccgatt tcagtcagac 10920
aaatactcat ttcagagatt ctatacttca tggaatcaag aagcaacgag ccataaatct 10980
gaaagacagc aacagaacaa agaaaaatgc cccccttcag ccggacagac ttactctcaa 11040
aggttctttg ttcctcccac tttcaagtcg gttggcaatc cagtggaagc acgcagatgg 11100
ctaagacaag ccagagcaaa cttctcagct gccaggaatg accttcataa aaatgccaat 11160
gagtgggtgt gctttaaatg ttacctttct accaagttag ctttgattgc agctgactat 11220
gctgtgaggg gaaagtctga taaagatgta aaaccaactg cacttgctca gaaaatagag 11280
gaatatagtc agcaacttga aggactgaca aatgatgttc acacattgga agcttatggt 11340
gtagacagtt taaaaacaag ataccctgat ttgcttccct ttcctcagat cccaaatgac 11400
aggttcactt ctgaggttgc tatgagggtg atggaatgta ctgcctgtat cataataaaa 11460
cttgaaaatt ttatgcaaca aaaagtgtga agatatttaa cgaaaaaaaa ggtagatctt 11520
gaatgtgttg tagcacgaat aaattgctgt acttcattaa gcttcattgc caattagcta 11580
ggaattgtta agcacattgc agattgttct tggagaattc tggagttgtt atgaacatga 11640
ataccaacgg aaaaccttaa ctgaatctaa aagaaaacta ttttgaagat ggtggtgagc 11700
tgcaaaatag ctggatggat ttgaatgatt gggatgatac atcattgaac tgcactttat 11760
ataaccaaag cttagcagtt tgttagataa gagtctatgt atgtctctgg ttaggatgaa 11820
gttaatttta tgtttttaac atggtatttt tgaaggagct aatgaaacac tggacatata 11880
attggtttaa acataagggg aattaagtct ttgtagtctg tcattttttt aagtggatcc 11940
tcttggatgc gttattttct catcagctgg ctctgatcat gaatttgttg taattttatg 12000
ttgtactcag tgcatttaag aaatggtaga gtattttaat cctattactt gactaagagt 12060
gtgaaggtag tacttttttag agtgcactga gtgcacttta catctttatt taaattttttt 12120
tttaacatct tatgtttaca ggcttcctgt ttgatgaaga tagcaacgga aaactcaaaa 12180
tggtggcagt tcttattacc agttgttagt attgtttctg gaaactgctt gccaagacaa 12240
catttattaa ctgttagaac acttgcttta tgtttgtgtg tacatatttt ccacaaatgt 12300
tataatttat atagtgtggt tgaacaggat gcaatctttt gttgtctaaa ggtgctgcag 12360
ttaaaaaaaa aacaaccttt tctttcaata tggcatgtag tggagttttt ttaactttaa 12420
aaacatcaaa aattgttaaa atcattgtgt tatctagtag tttataatta tcggcttata 12480
tttccccatg aatgatcaga actgacattt aattcatgtt tgtctcgcca tgcttcttta 12540
ctttaacata tttcttttgc agaatgtaaa aggtaatgat aattagttta tataagtgta 12600
ctggctgtaa atgatgctaa atatacttta tgcaattaag ggcttacaga acatgttgaa 12660
acttttttta cttttattgg gaataaggaa tgtttgcacc tccacatttt attgctt     12717
```

```
atgatttaca ggaagaccat gtactcagct gcagcttcta aatccagaac gatttgcacg 60
tcttatcaag gaagtaatga atacattctg gcctggcaga gaattgattg ttcaatggta 120
tccatttgat gaaaacagaa atcacccatc tgtttcatgg cttaagatgg tttggaaaaa 180
tctttatata cattttttcag aggatttgac tttatttgat gagatgccac ttatccccag 240
aactatacta gaggaaggtc agacatgtgt ggaactcatt agactcagga ttccatcgtt 300
agtcattta gacgatgaat ctgaagcaca gcttccagaa tttttagcag acattgtaca 360
aaaacttgga gggtttgtcc ttaaaaaatt agatgcatct atacaacatc cgcttattaa 420
aaaatatatt cattcaccat taccaagtgc tgttttgcag ataatggaga agatgccatt 480
gcagaaattg tgtaatcaaa taacttcgct acttccaaca cacaaagatg ccctgaggaa 540
gttcttggct agtttaaccg atagcagtga gaaagagaaa agaattattc aagaattggc 600
aatattcaag cgcattaacc attcttctga tcagggaatt tcctcttata caaaattgaa 660
aggttgtaaa gtcttacacc atactgccaa actcccagca gatctgcgac tttctatttc 720
agtaatagac agtagtgatg aagctactat tcgtctggca aacatgttga aaatagaaca 780
gttaaagacc actagctgct aaagcttgt tttaaaagat attgaaaatg cattttattc 840
acatgaagag gtaacacagc ttatgttatg ggtccttgag aatctatctt ctcttaaaaa 900
tgagaatcca aatgtgcttg agtggttaac accattaaaa ttcatccaga tatcacagga 960
acagatggta tcagctggtg aactctttga ccctgatata gaagtactaa aggatctctt 1020
ttgtaatgaa gaaggaacct atttcccacc ctcagttttt acctcaccag atattcttca 1080
```

```
ctccttaaga cagattggtt taaaaaacga agccagtctc aaagaaaagg atgttgtgca 1140
agtggcaaaa aaaattgaag ccttacaggt cggtgcttgt cctgatcaag atgttcttct 1200
gaagaaagcc aaaaccctct tactggtttt aaataagaat cacacactgt tgcaatcatc 1260
tgaaggaaag atgacattga agaaaataaa atgggttcca gcctgcaagg aaaggcctcc 1320
aaattatcca ggctctttgg tctggaaagg agatctctgt aatctctgtg caccaccaga 1380
tatgtgtgat gtaggccatg caattctcat tggctcctca cttcctcttg ttgaaagtat 1440
ccatgtaaac ctggaaaaag cattagggat cttcacaaaa cctagcctta gtgctgtctt 1500
aaaacacttt aaaattgttg ttgattggta ttcttcaaaa acctttagtg atgaagacta 1560
ctatcaattc cagcatattt tgcttgagat ttacggattc atgcatgatc atctaaatga 1620
agggaaagat tcttttagag ccttaaaatt tccatgggtt tggactggca aaaagttttg 1680
tccacttgcc caggctgtga ttaaaccaat ccatgatctt gaccttcagc cttatttgca 1740
taatgtacct aaaaccatgg caaaattcca ccaactattt aaggtctgtg gttcaataga 1800
ggagttgaca tcagatcata tttccatggt tattcagaag atatatctca aaagtgacca 1860
agatctcagt gaacaagaaa gcaaacaaaa tcttcatctt atgttgaata ttatcagatg 1920
gctgtatagc aatcagattc cagcaagccc caacacacca gttcctatac atcatagcaa 1980
aaatccttct aaacttatca tgaagccaat tcacgaatgc tgttattgtg acattaaagt 2040
tgatgacctt aatgacttac ttgaagattc tgtggaacca atcattttgg tgcatgagga 2100
catacccatg aaaactgcag aatggctaaa agttccatgc cttagtacaa gactgataaa 2160
tcctgaaaac atgggatttg agcagtcagg acaaagagag ccacttactg taagaattaa 2220
aaatattctg gaagaatacc cttcagtgtc agatattttt aaagaactac ttcaaaacgc 2280
tgatgatgca aatgcaacag aatgcagttt cttgattgat atgagaagaa atatggacat 2340
aagagagaat ctcctagacc cagggatggc agcttgtcat ggacctgctt tgtggtcatt 2400
caacaattct caattctcag attcagattt tgtgaacata actaggttag gagaatcttt 2460
aaaaagggga gaagttgaca aagttggaaa atttggtctt ggatttaatt ctgtgtacca 2520
tatcactgac attcccatca ttatgagtcg ggaattcatg ataatgttcg atccaaacat 2580
aaatcatatc agtaaacaca ttaaagacaa atccaatcct gggatcaaaa ttaattggag 2640
taaacaacag aaaagactta gaaaatttcc taatcagttc aaaccattta tagatgtatt 2700
tggctgtcag ttacctttga ctgtagaagc accttacagc tataatggaa cccttttccg 2760
actgtccttt agaactcaac aggaagcaaa agtgagtgaa gttagtagta cgtgctacaa 2820
tacagcagat atttattctc ttgtggatga atttagtctc tgtggacaca ggcttatcat 2880
tttcactcag agtgtaaagt caatgtattt gaagtacttg aaaattgagg aaaccaaccc 2940
cagtttagca caagatacag taataattaa aaaaaaatcc tgctcttcca aagcattgaa 3000
cacacctgtc ttaagtgttt taaaagaggc tgctaagctc atgaagactt gcagcagcag 3060
taataaaaag cttcccagtg atgaaccaaa gtcatcttgc attcttcaga tcacagtgga 3120
agaatttcac catgtgttca gaaggattgc tgatttacag tcgccacttt ttagaggtcc 3180
agatgatgac ccagctgctc tctttgaaat ggctaagtct ggccaatcaa aaaagccatc 3240
agatgagttg tcacagaaaa cagtagagtg taccacgtgg cttctgtgta cttgcatgga 3300
cacaggagag gctctgaagt tttccctgag tgagagtgga agaagactag gactggttcc 3360
atgtggggca gtaggagttc agctgtcaga aatccaggac cagaagtgga cagtgaaacc 3420
acacattgga gaggtgtttt gctatttacc tttacgaata aaaacaggct tgccagttca 3480
tatcaatggg tgctttgctg ttacatcaaa taggaaagaa atctggaaaa cagatacaaa 3540
aggacgatgg aataccacgt tcatgagaca tgttattgtg aaagcttact tacaggtact 3600
gagtgtctta cgggacctgg ccactagtgg ggagctaatg gattatactt actatgcagt 3660
atggcccgat cctgatttag ttcatgatga tttttctgta atttgccaag gattttatga 3720
agatatagct catggaaaag ggaaagaact gaccaaagtc ttctctgatg gatctacttg 3780
ggtttccatg aagaacgtaa gatttctaga tgactctata cttaaaagaa gagatgttgg 3840
ttcagcagcc ttcaagatat ttttgaaata cctcaagaag actgggtcca aaaacctttg 3900
tgctgttgaa cttccttctt cggtaaaatt aggatttgaa gaagctggct gcaaacagat 3960
actacttgaa aacacatttt cagagaaaca gttttttct gaagtgtttt ttccaaatat 4020
tcaagaaatt gaagcagaac ttagagatcc tttaatgatc tttgttctaa atgaaaaagt 4080
tgatgagttc tcgggagttc ttcgtgttac tccatgtatt ccttgttcct ggagggggca 4140
tcctttggtt ttgccatcaa gattgatcca ccccgaagga cgagttgcaa agttatttga 4200
tattaaagat gggagattcc cttatggttc tactcaggat tatctcaatc ctattatttt 4260
gattaaacta gttcagttag gtatggcaaa agatgatatt ttatgggatg atatgctaga 4320
acgtgcagtg tcagtagctg aaattaataa aagtgatcat gttgctgcat gcctaagaag 4380
tagtatctta ttgagtctta tcgatgagaa actaaaaata agggatccta gagcaaagga 4440
ttttgctgca aaatatcaaa caatccgctt ccttccattt ctgacaaaac cagcaggttt 4500
ttctttggac tggaaaggca acagttttaa gcctgaaacc atgtttgcag caactgacct 4560
```

```
ttatacagct gaacatcaag atatagtttg tcttttgcaa ccaattctaa atgaaaattc 4620
ccattctttt agaggttgtg gttcagtgtc attggctgtt aaagagtttt tgggattact 4680
caagaagcca acagttgatc tggttataaa ccaattgaaa gaagtagcaa aatcagttga 4740
tgatggaatt acactgtacc aggagaatat caccaatgct tgctacaaat accttcatga 4800
agccttgatg caaaatgaaa tcactaagat gtcaattatt gataagttaa aaccctttag 4860
cttcattcta gttgagaatg catatgttga ctcagaaaag gtttctttc atttaaattt 4920
tgaggcggca ccatacctt atcagttgcc taataagtat aaaaataatt ccgcgaact 4980
ttttgaaacc gtgggtgtga ggcagtcatg cactgttgaa gatttttgctc ttgtttttgga 5040
atctattgat caagaaagag gaacaaagca aataacagaa gagaattttc agctttgccg 5100
acgaataatc agtgaaggaa tatggagtct cattagagaa aagaaacaag aattttgtga 5160
gaaaaattat ggcaagatat tattgccaga tactaatctt atgcttctcc ctgctaaatc 5220
gttatgctac aatgattgcc cttggataaa agtaaaggat accactgtaa aatattgtca 5280
tgctgacata cccagggaag tagcagtaaa actaggagca gtcccaaagc gacacaaagc 5340
cttagaaaga tatgcatcca atgtctgttt tacaacactt ggcacagaat ttgggcagaa 5400
agaaaaattg accagcagaa ttaagagcat ccttaatgca tatccttctg aaaaggaaat 5460
gttgaaagag cttcttcaaa atgctgatga tgcaaaggcg acagaaatct gttttgtgtt 5520
tgatcctaga cagcatccag ttgatagaat atttgatgat aagtgggccc cattgcaagg 5580
gccagcactt tgtgtgtaca acaaccagcc atttacagaa gatgatgtta gaggaattca 5640
gaatcttgga aaaggcacga aagagggaaa tccttataaa actggacagt atggaatagg 5700
attcaattct gtgtatcata tcacagactg cccatctttt atttctggca atgacatcct 5760
gtgtattttt gatcctcatg ccagatatgc accaggggcc acatccatta gtcccggacg 5820
catgtttaga gatttggatg cagattttag gacacagttc tcagatgttc tggatctta 5880
tctgggaacc cattttaaac tggataattg cacaatgttc agatttcctc ttcgtaatgc 5940
agaaatggca aaagtttcgg aaatttcgtc tgttccagca tcagacagaa tggtccagaa 6000
tcttttggac aaactgcgct cagatggggc agaacttcta atgtttctta atcacatgga 6060
aaaaatttct atttgtgaaa tagataagag tactggagct ctaaatgtgc tgtattcagt 6120
aaagggcaaa atcacagatg gagacagatt gaaaaggaaa caatttcatg catctgtaat 6180
tgatagtgtt actaaaaaga ggcagctcaa agacatacca gttcaacaaa taacctatac 6240
tatggatact gaggactctg aaggaaatct tactacgtgg ctaatttgta atagatcagg 6300
cttttcaagt atggagaaag tatctaaaag tgtcatatca gctcacaaga accaagatat 6360
tactctttc ccacgtggtg gagtagctgc ctgcattact cacaactata aaaaacccca 6420
tagggccttc tgttttttgc ctctttcttt ggagactggg ctgccatttc atgtgaatgg 6480
ccactttgca ctggattcag ccagaaggaa cctgtggcgt gatgataatg gagttggtgt 6540
tcgaagtgac tggaataaca gtttaatgac agcattaata gctcctgcat atgttgaatt 6600
gctaatacag ttaaaaaaac ggtatttccc tggttctgat ccaacattat cagtgttaca 6660
gaacacccct attcatgttg taaaggacac tttaaagaag tttttatcgt ttttcccagt 6720
taaccgtctt gatctacagc cagatttata ttgtctagtg aaagcacttt acaattgcat 6780
tcacgaagac atgaaacgtc ttttaccdtgt tgtgcgggct ccaaatattg atggctctga 6840
cttgcactct gcagttataa ttacttggat caatatgtct acttctaata aaactagacc 6900
attttttgac aatttactac aggatgaatt acaacacctt aaaaatgcag attataatat 6960
caccacacgc aaaacagtag cagagaatgt ctataggctg aaacatctcc ttttagaaat 7020
tggtttcaac ttggtttata actgtgatga aactgctaat ctttaccact gtcttataga 7080
tgcagatatt cctgttagtt atgtgacccc tgctgatatc agatctttt taatgacatt 7140
ttcctctcct gacactaatt gccatattgg gaagctgcct tgtcgtctgc agcagactaa 7200
tctaaaactt tttcatagtt taaaactttt agttgattat tgttttaaag atgcagaaga 7260
aaatgagatt gaagttgagg gattgcccct tctcatcaca ctggacagtg ttttgcaaac 7320
ttttgatgca aaacgaccca agtttctaac aacatatcat gaattgattc catcccgcaa 7380
agacttgttt atgaatacat tatatttgaa atatagtaat attttattga actgtaaagt 7440
tgcaaaagtg tttgacattt ccagctttgc tgatttgtta tcctctgtgt gtcctcgaga 7500
atataagacc aaaagttgca caaagtggaa agacaatttt gcaagtgagt cttggcttaa 7560
gaatgcatgg catttttatta gtgaatctgt aagtgtgaaa gaagatcagg aagaaacaaa 7620
accaacattt gacattgttg ttgatactct aaaagactgg gcattgcttc caggaacaaa 7680
gtttactgtt tcagccaacc agcttgtggt tcctgaagga gatgttctgc ttcctctcag 7740
ccttatgcac attgcagttt ttccaaatgc ccagagtgat aaagtttttc atgctctaat 7800
gaaagccggc tgtattcagc ttgctttgaa caaaatctgt tccaaagaca gtgcacttgt 7860
tcctttgttg tcatgtcaca cagcaaatat agagagcccc acaagcatct tgaaggctct 7920
acattatatg gtccaaactt caacatttag agcagaaaaa ttagtagaaa atgattttga 7980
ggcacttttg atgtatttca actgcaattt gaatcatttg atgtcccaag atgatataaa 8040
```

```
aattctaaag tcacttccgt gctataaatc catcagtggc cgctatgtaa gcattggaaa 8100
atttggaaca tgctacgtac ttacaaaaag tatcccttca gctgaagtgg agaaatggac 8160
acaatcatca tcatctgcat ttcttgaaga aaaaatacac ttaaaagaac tatatgaggt 8220
gattggttgt gtacctgtag atgatcttga ggtatatttg aaacacctct taccaaaaat 8280
tgaaaatctc tcttatgatg caaaattaga gcacttgatc taccttaaga atagattatc 8340
aagtgctgag gaattatcag agattaagga acaacttttt gaaaaactgg aaagtttatt 8400
gataatccat gatgctaaca gtagactaaa gcaagcaaag catttctatg atagaactgt 8460
gagagttttt gaagttatgc ttcctgaaaa attgtttatt cctaatgatt tctttaagaa 8520
attggaacaa cttataaaac ccaaaaatca tgttacattt atgacatcct gggtggaatt 8580
cttaagaaat attggactaa aatacatact ttctcagcag cagttgttac agtttgctaa 8640
ggaaatcagt gtgagggcta atacagaaaa ctggtccaaa gaaacattgc aaaatacagt 8700
tgatatcctt ctgcatcata tattccaaga acgaatggat ttgttatctg gaaattttct 8760
gaaagaacta tctttaatac cattcttatg tcctgagcgg gccccgcgg aattcattag 8820
atttcatcct caatatcaag aggtaaatgg aacacttcct cttataaagt tcaatggagc 8880
acaggtaaat ccaaaattca agcaatgtga tgtactccag ctgttatgga catcctgccc 8940
tattcttcca gagaaagcta caccccttaag cattaaagaa caagaaggta gtgaccttgg 9000
tccacaagaa cagcttgaac aagtttttaaa tatgcttaat gttaacctgg atcctcctct 9060
tgataaggta atcaataact gcagaaacat atgcaacata acgacgttgg atgaagaaat 9120
ggtaaaaact agagcaaaag tcttaaggag catatatgaa ttcctcagtg cagaaaaaag 9180
ggaatttcgt tttcagttgc gaggggttgc ttttgtgatg gtagaagatg gttggaaact 9240
tctgaagcct gaggaggtag tcataaacct agaatatgaa tctgatttta aaccttattt 9300
gtacaagcta cctttagaac ttggcacatt tcaccagttg ttcaaacact taggtactga 9360
agatattatt tcaactaagc aatatgttga agtgttgagc cgcatattta aaaattctga 9420
gggcaaacaa ttagatccta atgaaatgcg tacagttaag agagtagttt ctggtctgtt 9480
caggagtcta cagaatgatt cagtcaaggt gaggagtgat ctcgagaatg tacgagacct 9540
tgcgctttac ctcccaagcc aggatggtag attggtaaag tcaagcatct tagtgtttga 9600
cgatgcgcca cattataaaa gtagaatcca ggggaatatt ggtgtgcaaa tgttagttga 9660
tctcagccag tgctacttag ggaaagacca tggatttcac actaagttga taatgctctt 9720
tcctcaaaaa cttagacctc gattattgag cagtatactt gaagaacaat tagatgaaga 9780
gactcccaaa gtttgtcagt ttggagcgtt gtgttctctt caaggaagat tgcagttact 9840
cttgtcttct gaacagttca ttacaggact gattagaatt atgaagcatg aaaatgataa 9900
tgcttttctg gccaatgaag aaaaagccat aagactttgc aaagccctaa gagaaggatt 9960
gaaagtatcc tgctttgaaa agcttcaaac aacattaaga gttaaaggtt ttaatcctat 10020
tccccacagc agaagtgaaa ctttttgcttt tttgaagcga tttggtaatg cagtcatctt 10080
gctctacatt caacattcag acagtaaaga cattaatttc ctgttagcac tggcaatgac 10140
tcttaaatca gcaactgaca atttgatttc tgacacttca tatttaattg ctatgctagg 10200
atgcaatgat atttacagga ttggtgagaa acttgacagt ttaggagtga aatatgactc 10260
ttcggagcca tcaaaactgg aacttccaat gcctggcaca ccaattcctg ctgaaattca 10320
ttacactctg cttatggacc caatgaatgt tttttacccg ggagaatatg ttgggtacct 10380
tgttgatgct gaaggtggtg atatctatgg atcataccag ccaacataca catatgcaat 10440
tattgtacaa gaagttgaaa gagaagatgc tgacaattct agttttctag aaagatata 10500
tcagatagat attggttata gtgaatataa aatagttagc tctcttgatc tgtataagtt 10560
ttcaagacct gaggaaagct ctcaaagcag ggacagtgct ccttctacac caaccagccc 10620
cactgagttc ctcacccctg gcctgagaag cattcctcct cttttctctg gtagagagag 10680
ccacaagact tcttccaaac atcagtcccc caaaaagctt aaggttaatt ctttaccaga 10740
aatcttaaaa gaagtgacat ctgtggtgga gcaagcatgg aagcttccag aatcggaacg 10800
aaaaaagatt attaggcggt tgtatttgaa atggcatcct gacaaaaatc cagagaacca 10860
tgacattgcc aatgaagttt ttaaacattt gcagaatgaa atcaacagat tagaaaaaca 10920
ggcttttcta gatcaaaatg cagacagggc ctccagacga acattttcaa cctcagcatc 10980
ccgatttcag tcagacaaat actcatttca gagattctat acttcatgga tcaagaagc 11040
aacgagccat aaatctgaaa gacagcaaca gaacaaagaa aaatgccccc cttcagccgg 11100
acagacttac tctcaaaggt tctttgttcc tcccactttc aagtcggttg gcaatccagt 11160
ggaagcacgc agatggctaa gacaagccag agcaaacttc tcagctgcca ggaatgacct 11220
tcataaaaat gccaatgagt gggtgtgctt taaatgttac ctttctacca gttagctttt 11280
gattgcagct gactatgctg tgaggggaaa gtctgataaa gatgtaaaac caactgcact 11340
tgctcagaaa atagaggaat atagtcagca acttgaagga ctgacaaatg atgttcacac 11400
attggaagct tatggtgtag acagtttaaa aacaagatac cctgatttgc ttcccttcc 11460
tcagatccca aatgacaggt tcacttctga ggttgctatg agggtgatgg aatgtactgc 11520
```

```
ctgtatcata ataaaacttg aaaattttat gcaacaaaaa gtgtgaagat atttaacgaa 11580
aaaaaaggta gatcttgaat gtgttgtagc acgaataaat tgctgtactt cattaagctt 11640
cattgccaat tagctaggaa ttgttaagca cattgcagat tgttcttgga gaattctgga 11700
gttgttatga acatgaatac caacggaaaa ccttaactga atctaaaaga aaactatttt 11760
gaagatggtg gtgagctgca aaatagctgg atggatttga atgattggga tgatacatca 11820
ttgaactgca ctttatataa ccaaagctta gcagtttgtt agataagagt ctatgtatgt 11880
ctctggttag gatgaagtta attttatgtt tttaacatgg tatttttgaa ggagctaatg 11940
aaacactgga catataattg gtttaaacat aaggggaatt aagtctttgt agtctgtcat 12000
tttttaagt ggatcctctt ggatgcgtta ttttctcatc agctggctct gatcatgaat 12060
ttgttgtaat tttatgttgt actcagtgca tttaagaaat ggtagagtat tttaatccta 12120
ttacttgact aagagtgtga aggtagtact ttttagagtg cactgagtgc actttacatc 12180
tttatttaaa ttttttttta acatcttatg tttacaggct tcctgtttga tgaagatagc 12240
aacggaaaac tcaaaatggt ggcagttctt attaccagtt gttagtattg tttctggaaa 12300
ctgcttgcca agacaacatt tattaactgt tagaacactt gctttatgtt tgtgtgtaca 12360
tattttccac aaatgttata atttatatag tgtggttgaa caggatgcaa tcttttgttg 12420
tctaaaggtg ctgcagttaa aaaaaaaaca accttttctt tcaatatggc atgtagtgga 12480
gtttttttaa ctttaaaaac atcaaaaatt gttaaaatca ttgtgttatc tagtagttta 12540
taattatcgg cttatatttc cccatgaatg atcagaactg acatttaatt catgtttgtc 12600
tcgccatgct tctttacttt aacatatttc ttttgcagaa tgtaaaggt aatgataatt 12660
agtttatata agtgtactgg ctgtaaatga tgctaaatat actttatgca attaagggct 12720
tacagaacat gttgaaactt tttttacttt tattgggaat aaggaatgtt tgcacctcca 12780
cattttattg ctt                                                 12793
```

<210> 16
<211> 3829
<212> PRT
<213> Homo sapiens

<400> 16

```
Met Asn Thr Phe Trp Pro Gly Arg Glu Leu Ile Val Gln Trp Tyr Pro
1               5                   10                  15
Phe Asp Glu Asn Arg Asn His Pro Ser Val Ser Trp Leu Lys Met Val
            20                  25                  30
Trp Lys Asn Leu Tyr Ile His Phe Ser Glu Asp Leu Thr Leu Phe Asp
        35                  40                  45
Glu Met Pro Leu Ile Pro Arg Thr Ile Leu Glu Glu Gly Gln Thr Cys
    50                  55                  60
Val Glu Leu Ile Arg Leu Arg Ile Pro Ser Leu Val Ile Leu Asp Asp
65                  70                  75                  80
Glu Ser Glu Ala Gln Leu Pro Glu Phe Leu Ala Asp Ile Val Gln Lys
                85                  90                  95
Leu Gly Gly Phe Val Leu Lys Lys Leu Asp Ala Ser Ile Gln His Pro
            100                 105                 110
Leu Ile Lys Lys Tyr Ile His Ser Pro Leu Pro Ser Ala Val Leu Gln
        115                 120                 125
Ile Met Glu Lys Met Pro Leu Gln Lys Leu Cys Asn Gln Ile Thr Ser
    130                 135                 140
Leu Leu Pro Thr His Lys Asp Ala Leu Arg Lys Phe Leu Ala Ser Leu
145                 150                 155                 160
Thr Asp Ser Ser Glu Lys Glu Lys Arg Ile Ile Gln Glu Leu Ala Ile
                165                 170                 175
Phe Lys Arg Ile Asn His Ser Ser Asp Gln Gly Ile Ser Ser Tyr Thr
            180                 185                 190
Lys Leu Lys Gly Cys Lys Val Leu His His Thr Ala Lys Leu Pro Ala
        195                 200                 205
```

```
Asp Leu Arg Leu Ser Ile Ser Val Ile Asp Ser Ser Asp Glu Ala Thr
    210             215             220
Ile Arg Leu Ala Asn Met Leu Lys Ile Glu Gln Leu Lys Thr Thr Ser
225             230             235             240
Cys Leu Lys Leu Val Leu Lys Asp Ile Glu Asn Ala Phe Tyr Ser His
            245             250             255
Glu Glu Val Thr Gln Leu Met Leu Trp Val Leu Glu Asn Leu Ser Ser
            260             265             270
Leu Lys Asn Glu Asn Pro Asn Val Leu Glu Trp Leu Thr Pro Leu Lys
        275             280             285
Phe Ile Gln Ile Ser Gln Glu Gln Met Val Ser Ala Gly Glu Leu Phe
    290             295             300
Asp Pro Asp Ile Glu Val Leu Lys Asp Leu Phe Cys Asn Glu Glu Gly
305             310             315             320
Thr Tyr Phe Pro Pro Ser Val Phe Thr Ser Pro Asp Ile Leu His Ser
            325             330             335
Leu Arg Gln Ile Gly Leu Lys Asn Glu Ala Ser Leu Lys Glu Lys Asp
            340             345             350
Val Val Gln Val Ala Lys Lys Ile Glu Ala Leu Gln Val Gly Ala Cys
            355             360             365
Pro Asp Gln Asp Val Leu Leu Lys Lys Ala Lys Thr Leu Leu Leu Val
    370             375             380
Leu Asn Lys Asn His Thr Leu Leu Gln Ser Ser Glu Gly Lys Met Thr
385             390             395             400
Leu Lys Lys Ile Lys Trp Val Pro Ala Cys Lys Glu Arg Pro Pro Asn
            405             410             415
Tyr Pro Gly Ser Leu Val Trp Lys Gly Asp Leu Cys Asn Leu Cys Ala
            420             425             430
Pro Pro Asp Met Cys Asp Val Gly His Ala Ile Leu Ile Gly Ser Ser
    435             440             445
Leu Pro Leu Val Glu Ser Ile His Val Asn Leu Glu Lys Ala Leu Gly
    450             455             460
Ile Phe Thr Lys Pro Ser Leu Ser Ala Val Leu Lys His Phe Lys Ile
465             470             475             480
Val Val Asp Trp Tyr Ser Ser Lys Thr Phe Ser Asp Glu Asp Tyr Tyr
            485             490             495
Gln Phe Gln His Ile Leu Leu Glu Ile Tyr Gly Phe Met His Asp His
            500             505             510
Leu Asn Glu Gly Lys Asp Ser Phe Arg Ala Leu Lys Phe Pro Trp Val
    515             520             525
Trp Thr Gly Lys Lys Phe Cys Pro Leu Ala Gln Ala Val Ile Lys Pro
    530             535             540
Ile His Asp Leu Asp Leu Gln Pro Tyr Leu His Asn Val Pro Lys Thr
545             550             555             560
Met Ala Lys Phe His Gln Leu Phe Lys Val Cys Gly Ser Ile Glu Glu
            565             570             575
Leu Thr Ser Asp His Ile Ser Met Val Ile Gln Lys Ile Tyr Leu Lys
            580             585             590
Ser Asp Gln Asp Leu Ser Glu Gln Glu Ser Lys Gln Asn Leu His Leu
    595             600             605
Met Leu Asn Ile Ile Arg Trp Leu Tyr Ser Asn Gln Ile Pro Ala Ser
    610             615             620
Pro Asn Thr Pro Val Pro Ile His His Ser Lys Asn Pro Ser Lys Leu
625             630             635             640
Ile Met Lys Pro Ile His Glu Cys Cys Tyr Cys Asp Ile Lys Val Asp
            645             650             655
Asp Leu Asn Asp Leu Leu Glu Asp Ser Val Glu Pro Ile Ile Leu Val
            660             665             670
```

```
His Glu Asp Ile Pro Met Lys Thr Ala Glu Trp Leu Lys Val Pro Cys
        675             680             685
Leu Ser Thr Arg Leu Ile Asn Pro Glu Asn Met Gly Phe Glu Gln Ser
        690             695             700
Gly Gln Arg Glu Pro Leu Thr Val Arg Ile Lys Asn Ile Leu Glu Glu
705             710             715             720
Tyr Pro Ser Val Ser Asp Ile Phe Lys Glu Leu Leu Gln Asn Ala Asp
            725             730             735
Asp Ala Asn Ala Thr Glu Cys Ser Phe Leu Ile Asp Met Arg Arg Asn
        740             745             750
Met Asp Ile Arg Glu Asn Leu Leu Asp Pro Gly Met Ala Ala Cys His
        755             760             765
Gly Pro Ala Leu Trp Ser Phe Asn Asn Ser Gln Phe Ser Asp Ser Asp
        770             775             780
Phe Val Asn Ile Thr Arg Leu Gly Glu Ser Leu Lys Arg Gly Glu Val
785             790             795             800
Asp Lys Val Gly Lys Phe Gly Leu Gly Phe Asn Ser Val Tyr His Ile
            805             810             815
Thr Asp Ile Pro Ile Ile Met Ser Arg Glu Phe Met Ile Met Phe Asp
        820             825             830
Pro Asn Ile Asn His Ile Ser Lys His Ile Lys Asp Lys Ser Asn Pro
        835             840             845
Gly Ile Lys Ile Asn Trp Ser Lys Gln Gln Lys Arg Leu Arg Lys Phe
850             855             860
Pro Asn Gln Phe Lys Pro Phe Ile Asp Val Phe Gly Cys Gln Leu Pro
865             870             875             880
Leu Thr Val Glu Ala Pro Tyr Ser Tyr Asn Gly Thr Leu Phe Arg Leu
            885             890             895
Ser Phe Arg Thr Gln Gln Glu Ala Lys Val Ser Glu Val Ser Ser Thr
        900             905             910
Cys Tyr Asn Thr Ala Asp Ile Tyr Ser Leu Val Asp Glu Phe Ser Leu
        915             920             925
Cys Gly His Arg Leu Ile Ile Phe Thr Gln Ser Val Lys Ser Met Tyr
        930             935             940
Leu Lys Tyr Leu Lys Ile Glu Glu Thr Asn Pro Ser Leu Ala Gln Asp
945             950             955             960
Thr Val Ile Ile Lys Lys Lys Ser Cys Ser Ser Lys Ala Leu Asn Thr
            965             970             975
Pro Val Leu Ser Val Leu Lys Glu Ala Ala Lys Leu Met Lys Thr Cys
            980             985             990
Ser Ser Ser Asn Lys Lys Leu Pro Ser Asp Glu Pro Lys Ser Ser Cys
        995             1000            1005
Ile Leu Gln Ile Thr Val Glu Glu Phe His His Val Phe Arg Arg Ile
        1010            1015            1020
Ala Asp Leu Gln Ser Pro Leu Phe Arg Gly Pro Asp Asp Pro Ala
1025            1030            1035            1040
Ala Leu Phe Glu Met Ala Lys Ser Gly Gln Ser Lys Lys Pro Ser Asp
            1045            1050            1055
Glu Leu Ser Gln Lys Thr Val Glu Cys Thr Thr Trp Leu Leu Cys Thr
            1060            1065            1070
Cys Met Asp Thr Gly Glu Ala Leu Lys Phe Ser Leu Ser Glu Ser Gly
        1075            1080            1085
Arg Arg Leu Gly Leu Val Pro Cys Gly Ala Val Gly Val Gln Leu Ser
        1090            1095            1100
Glu Ile Gln Asp Gln Lys Trp Thr Val Lys Pro His Ile Gly Glu Val
1105            1110            1115            1120
Phe Cys Tyr Leu Pro Leu Arg Ile Lys Thr Gly Leu Pro Val His Ile
            1125            1130            1135
```

```
Asn Gly Cys Phe Ala Val Thr Ser Asn Arg Lys Glu Ile Trp Lys Thr
        1140                1145                1150
Asp Thr Lys Gly Arg Trp Asn Thr Thr Phe Met Arg His Val Ile Val
        1155                1160                1165
Lys Ala Tyr Leu Gln Val Leu Ser Val Leu Arg Asp Leu Ala Thr Ser
    1170                1175                1180
Gly Glu Leu Met Asp Tyr Thr Tyr Tyr Ala Val Trp Pro Asp Pro Asp
1185                1190                1195                1200
Leu Val His Asp Asp Phe Ser Val Ile Cys Gln Gly Phe Tyr Glu Asp
                1205                1210                1215
Ile Ala His Gly Lys Gly Lys Glu Leu Thr Lys Val Phe Ser Asp Gly
            1220                1225                1230
Ser Thr Trp Val Ser Met Lys Asn Val Arg Phe Leu Asp Asp Ser Ile
        1235                1240                1245
Leu Lys Arg Arg Asp Val Gly Ser Ala Ala Phe Lys Ile Phe Leu Lys
    1250                1255                1260
Tyr Leu Lys Lys Thr Gly Ser Lys Asn Leu Cys Ala Val Glu Leu Pro
1265                1270                1275                1280
Ser Ser Val Lys Leu Gly Phe Glu Glu Ala Gly Cys Lys Gln Ile Leu
                1285                1290                1295
Leu Glu Asn Thr Phe Ser Glu Lys Gln Phe Phe Ser Glu Val Phe Phe
            1300        |       1305                1310
Pro Asn Ile Gln Glu Ile Glu Ala Glu Leu Arg Asp Pro Leu Met Ile
        1315                1320                1325
Phe Val Leu Asn Glu Lys Val Asp Glu Phe Ser Gly Val Leu Arg Val
        1330                1335                1340
Thr Pro Cys Ile Pro Cys Ser Leu Glu Gly His Pro Leu Val Leu Pro
1345                1350                1355                1360
Ser Arg Leu Ile His Pro Glu Gly Arg Val Ala Lys Leu Phe Asp Ile
            1365                1370                1375
Lys Asp Gly Arg Phe Pro Tyr Gly Ser Thr Gln Asp Tyr Leu Asn Pro
        1380                1385                1390
Ile Ile Leu Ile Lys Leu Val Gln Leu Gly Met Ala Lys Asp Asp Ile
        1395                1400                1405
Leu Trp Asp Asp Met Leu Glu Arg Ala Val Ser Val Ala Glu Ile Asn
    1410                1415                1420
Lys Ser Asp His Val Ala Ala Cys Leu Arg Ser Ser Ile Leu Leu Ser
1425                1430                1435                1440
Leu Ile Asp Glu Lys Leu Lys Ile Arg Asp Pro Arg Ala Lys Asp Phe
            1445                1450                1455
Ala Ala Lys Tyr Gln Thr Ile Arg Phe Leu Pro Phe Leu Thr Lys Pro
        1460                1465                1470
Ala Gly Phe Ser Leu Asp Trp Lys Gly Asn Ser Phe Lys Pro Glu Thr
        1475                1480                1485
Met Phe Ala Ala Thr Asp Leu Tyr Thr Ala Glu His Gln Asp Ile Val
    1490                1495                1500
Cys Leu Leu Gln Pro Ile Leu Asn Glu Asn Ser His Ser Phe Arg Gly
1505                1510                1515                1520
Cys Gly Ser Val Ser Leu Ala Val Lys Glu Phe Leu Gly Leu Leu Lys
            1525                1530                1535
Lys Pro Thr Val Asp Leu Val Ile Asn Gln Leu Lys Glu Val Ala Lys
        1540                1545                1550
Ser Val Asp Asp Gly Ile Thr Leu Tyr Gln Glu Asn Ile Thr Asn Ala
        1555                1560                1565
Cys Tyr Lys Tyr Leu His Glu Ala Leu Met Gln Asn Glu Ile Thr Lys
    1570                1575                1580
Met Ser Ile Ile Asp Lys Leu Lys Pro Phe Ser Phe Ile Leu Val Glu
1585                1590                1595                1600
```

```
Asn Ala Tyr Val Asp Ser Glu Lys Val Ser Phe His Leu Asn Phe Glu
            1605                1610                1615
Ala Ala Pro Tyr Leu Tyr Gln Leu Pro Asn Lys Tyr Lys Asn Asn Phe
            1620                1625                1630
Arg Glu Leu Phe Glu Thr Val Gly Val Arg Gln Ser Cys Thr Val Glu
            1635                1640                1645
Asp Phe Ala Leu Val Leu Glu Ser Ile Asp Gln Glu Arg Gly Thr Lys
            1650                1655                1660
Gln Ile Thr Glu Glu Asn Phe Gln Leu Cys Arg Arg Ile Ile Ser Glu
        1665                1670                1675                1680
Gly Ile Trp Ser Leu Ile Arg Glu Lys Lys Gln Glu Phe Cys Glu Lys
            1685                1690                1695
Asn Tyr Gly Lys Ile Leu Leu Pro Asp Thr Asn Leu Met Leu Leu Pro
            1700                1705                1710
Ala Lys Ser Leu Cys Tyr Asn Asp Cys Pro Trp Ile Lys Val Lys Asp
            1715                1720                1725
Thr Thr Val Lys Tyr Cys His Ala Asp Ile Pro Arg Glu Val Ala Val
            1730                1735                1740
Lys Leu Gly Ala Val Pro Lys Arg His Lys Ala Leu Glu Arg Tyr Ala
        1745                1750                1755                1760
Ser Asn Val Cys Phe Thr Thr Leu Gly Thr Glu Phe Gly Gln Lys Glu
            1765                1770                1775
Lys Leu Thr Ser Arg Ile Lys Ser Ile Leu Asn Ala Tyr Pro Ser Glu
            1780                1785                1790
Lys Glu Met Leu Lys Glu Leu Leu Gln Asn Ala Asp Asp Ala Lys Ala
            1795                1800                1805
Thr Glu Ile Cys Phe Val Phe Asp Pro Arg Gln His Pro Val Asp Arg
        1810                1815                1820
Ile Phe Asp Asp Lys Trp Ala Pro Leu Gln Gly Pro Ala Leu Cys Val
    1825                1830                1835                1840
Tyr Asn Asn Gln Pro Phe Thr Glu Asp Asp Val Arg Gly Ile Gln Asn
            1845                1850                1855
Leu Gly Lys Gly Thr Lys Glu Gly Asn Pro Tyr Lys Thr Gly Gln Tyr
            1860                1865                1870
Gly Ile Gly Phe Asn Ser Val Tyr His Ile Thr Asp Cys Pro Ser Phe
            1875                1880                1885
Ile Ser Gly Asn Asp Ile Leu Cys Ile Phe Asp Pro His Ala Arg Tyr
        1890                1895                1900
Ala Pro Gly Ala Thr Ser Ile Ser Pro Gly Arg Met Phe Arg Asp Leu
    1905                1910                1915                1920
Asp Ala Asp Phe Arg Thr Gln Phe Ser Asp Val Leu Asp Leu Tyr Leu
            1925                1930                1935
Gly Thr His Phe Lys Leu Asp Asn Cys Thr Met Phe Arg Phe Pro Leu
            1940                1945                1950
Arg Asn Ala Glu Met Ala Lys Val Ser Glu Ile Ser Ser Val Pro Ala
            1955                1960                1965
Ser Asp Arg Met Val Gln Asn Leu Leu Asp Lys Leu Arg Ser Asp Gly
    1970                1975                1980
Ala Glu Leu Leu Met Phe Leu Asn His Met Glu Lys Ile Ser Ile Cys
    1985                1990                1995                2000
Glu Ile Asp Lys Ser Thr Gly Ala Leu Asn Val Leu Tyr Ser Val Lys
            2005                2010                2015
Gly Lys Ile Thr Asp Gly Asp Arg Leu Lys Arg Lys Gln Phe His Ala
            2020                2025                2030
Ser Val Ile Asp Ser Val Thr Lys Lys Arg Gln Leu Lys Asp Ile Pro
        2035                2040                2045
Val Gln Gln Ile Thr Tyr Thr Met Asp Thr Glu Asp Ser Glu Gly Asn
    2050                2055                2060
```

Leu Thr Thr Trp Leu Ile Cys Asn Arg Ser Gly Phe Ser Ser Met Glu
2065   2070   2075   2080

Lys Val Ser Lys Ser Val Ile Ser Ala His Lys Asn Gln Asp Ile Thr
          2085   2090   2095

Leu Phe Pro Arg Gly Gly Val Ala Ala Cys Ile Thr His Asn Tyr Lys
            2100   2105   2110

Lys Pro His Arg Ala Phe Cys Phe Leu Pro Leu Ser Leu Glu Thr Gly
            2115   2120   2125

Leu Pro Phe His Val Asn Gly His Phe Ala Leu Asp Ser Ala Arg Arg
            2130   2135   2140

Asn Leu Trp Arg Asp Asp Asn Gly Val Gly Val Arg Ser Asp Trp Asn
2145   2150   2155   2160

Asn Ser Leu Met Thr Ala Leu Ile Ala Pro Ala Tyr Val Glu Leu Leu
            2165   2170   2175

Ile Gln Leu Lys Lys Arg Tyr Phe Pro Gly Ser Asp Pro Thr Leu Ser
            2180   2185   2190

Val Leu Gln Asn Thr Pro Ile His Val Val Lys Asp Thr Leu Lys Lys
            2195   2200   2205

Phe Leu Ser Phe Phe Pro Val Asn Arg Leu Asp Leu Gln Pro Asp Leu
            2210   2215   2220

Tyr Cys Leu Val Lys Ala Leu Tyr Asn Cys Ile His Glu Asp Met Lys
2225   2230   2235   2240

Arg Leu Leu Pro Val Val Arg Ala Pro Asn Ile Asp Gly Ser Asp Leu
            2245   2250   2255

His Ser Ala Val Ile Ile Thr Trp Ile Asn Met Ser Thr Ser Asn Lys
            2260   2265   2270

Thr Arg Pro Phe Phe Asp Asn Leu Leu Gln Asp Glu Leu Gln His Leu
            2275   2280   2285

Lys Asn Ala Asp Tyr Asn Ile Thr Thr Arg Lys Thr Val Ala Glu Asn
            2290   2295   2300

Val Tyr Arg Leu Lys His Leu Leu Leu Glu Ile Gly Phe Asn Leu Val
2305   2310   2315   2320

Tyr Asn Cys Asp Glu Thr Ala Asn Leu Tyr His Cys Leu Ile Asp Ala
            2325   2330   2335

Asp Ile Pro Val Ser Tyr Val Thr Pro Ala Asp Ile Arg Ser Phe Leu
            2340   2345   2350

Met Thr Phe Ser Ser Pro Asp Thr Asn Cys His Ile Gly Lys Leu Pro
            2355   2360   2365

Cys Arg Leu Gln Gln Thr Asn Leu Lys Leu Phe His Ser Leu Lys Leu
2370   2375   2380

Leu Val Asp Tyr Cys Phe Lys Asp Ala Glu Glu Asn Glu Ile Glu Val
2385   / 2390   2395   2400

Glu Gly Leu Pro Leu Leu Ile Thr Leu Asp Ser Val Leu Gln Thr Phe
            2405   2410   2415

Asp Ala Lys Arg Pro Lys Phe Leu Thr Thr Tyr His Glu Leu Ile Pro
            2420   2425   2430

Ser Arg Lys Asp Leu Phe Met Asn Thr Leu Tyr Leu Lys Tyr Ser Asn
            2435   2440   2445

Ile Leu Leu Asn Cys Lys Val Ala Lys Val Phe Asp Ile Ser Ser Phe
            2450   2455   2460

Ala Asp Leu Leu Ser Ser Val Leu Pro Arg Glu Tyr Lys Thr Lys Ser
2465   2470   2475   2480

Cys Thr Lys Trp Lys Asp Asn Phe Ala Ser Glu Ser Trp Leu Lys Asn
            2485   2490   2495

Ala Trp His Phe Ile Ser Glu Ser Val Ser Val Lys Glu Asp Gln Glu
            2500   2505   2510

Glu Thr Lys Pro Thr Phe Asp Ile Val Val Asp Thr Leu Lys Asp Trp
            2515   2520   2525

Ala Leu Leu Pro Gly Thr Lys Phe Thr Val Ser Ala Asn Gln Leu Val
       2530   2535   2540
Val Pro Glu Gly Asp Val Leu Leu Pro Leu Ser Leu Met His Ile Ala
2545   2550   2555   2560
Val Phe Pro Asn Ala Gln Ser Asp Lys Val Phe His Ala Leu Met Lys
             2565   2570   2575
Ala Gly Cys Ile Gln Leu Ala Leu Asn Lys Ile Cys Ser Lys Asp Ser
             2580   2585   2590
Ala Leu Val Pro Leu Leu Ser Cys His Thr Ala Asn Ile Glu Ser Pro
             2595   2600   2605
Thr Ser Ile Leu Lys Ala Leu His Tyr Met Val Gln Thr Ser Thr Phe
       2610   2615   2620
Arg Ala Glu Lys Leu Val Glu Asn Asp Phe Glu Ala Leu Leu Met Tyr
2625   2630   2635   2640
Phe Asn Cys Asn Leu Asn His Leu Met Ser Gln Asp Asp Ile Lys Ile
             2645   2650   2655
Leu Lys Ser Leu Pro Cys Tyr Lys Ser Ile Ser Gly Arg Tyr Val Ser
             2660   2665   2670
Ile Gly Lys Phe Gly Thr Cys Tyr Val Leu Thr Lys Ser Ile Pro Ser
       2675   2680   2685
Ala Glu Val Glu Lys Trp Thr Gln Ser Ser Ser Ser Ala Phe Leu Glu
       2690   2695   2700
Glu Lys Ile His Leu Lys Glu Leu Tyr Glu Val Ile Gly Cys Val Pro
2705   2710   2715   2720
Val Asp Asp Leu Glu Val Tyr Leu Lys His Leu Leu Pro Lys Ile Glu
             2725   2730   2735
Asn Leu Ser Tyr Asp Ala Lys Leu Glu His Leu Ile Tyr Leu Lys Asn
       2740   2745   2750
Arg Leu Ser Ser Ala Glu Glu Leu Ser Glu Ile Lys Glu Gln Leu Phe
       2755   2760   2765
Glu Lys Leu Glu Ser Leu Leu Ile Ile His Asp Ala Asn Ser Arg Leu
       2770   2775   2780
Lys Gln Ala Lys His Phe Tyr Asp Arg Thr Val Arg Val Phe Glu Val
2785   2790   2795   2800
Met Leu Pro Glu Lys Leu Phe Ile Pro Asn Asp Phe Phe Lys Lys Leu
             2805   2810   2815
Glu Gln Leu Ile Lys Pro Lys Asn His Val Thr Phe Met Thr Ser Trp
       2820   2825   2830
Val Glu Phe Leu Arg Asn Ile Gly Leu Lys Tyr Ile Leu Ser Gln Gln
       2835   2840   2845
Gln Leu Leu Gln Phe Ala Lys Glu Ile Ser Val Arg Ala Asn Thr Glu
2850   2855   2860
Asn Trp Ser Lys Glu Thr Leu Gln Asn Thr Val Asp Ile Leu Leu His
2865   2870   2875   2880
His Ile Phe Gln Glu Arg Met Asp Leu Leu Ser Gly Asn Phe Leu Lys
             2885   2890   2895
Glu Leu Ser Leu Ile Pro Phe Leu Cys Pro Glu Arg Ala Pro Ala Glu
             2900   2905   2910
Phe Ile Arg Phe His Pro Gln Tyr Gln Glu Val Asn Gly Thr Leu Pro
       2915   2920   2925
Leu Ile Lys Phe Asn Gly Ala Gln Val Asn Pro Lys Phe Lys Gln Cys
       2930   2935   2940
Asp Val Leu Gln Leu Leu Trp Thr Ser Cys Pro Ile Leu Pro Glu Lys
2945   2950   2955   2960
Ala Thr Pro Leu Ser Ile Lys Glu Gln Glu Gly Ser Asp Leu Gly Pro
             2965   2970   2975
Gln Glu Gln Leu Glu Gln Val Leu Asn Met Leu Asn Val Asn Leu Asp
       2980   2985   2990

```
Pro Pro Leu Asp Lys Val Ile Asn Asn Cys Arg Asn Ile Cys Asn Ile
        2995                3000                3005
Thr Thr Leu Asp Glu Glu Met Val Lys Thr Arg Ala Lys Val Leu Arg
        3010                3015                3020
Ser Ile Tyr Glu Phe Leu Ser Ala Glu Lys Arg Glu Phe Arg Phe Gln
3025                3030                3035                3040
Leu Arg Gly Val Ala Phe Val Met Val Glu Asp Gly Trp Lys Leu Leu
            3045            3050                3055
Lys Pro Glu Glu Val Val Ile Asn Leu Glu Tyr Glu Ser Asp Phe Lys
            3060            3065                3070
Pro Tyr Leu Tyr Lys Leu Pro Leu Glu Leu Gly Thr Phe His Gln Leu
        3075                3080                3085
Phe Lys His Leu Gly Thr Glu Asp Ile Ile Ser Thr Lys Gln Tyr Val
        3090                3095                3100
Glu Val Leu Ser Arg Ile Phe Lys Asn Ser Glu Gly Lys Gln Leu Asp
3105                3110                3115                3120
Pro Asn Glu Met Arg Thr Val Lys Arg Val Val Ser Gly Leu Phe Arg
            3125                3130                3135
Ser Leu Gln Asn Asp Ser Val Lys Val Arg Ser Asp Leu Glu Asn Val
            3140                3145                3150
Arg Asp Leu Ala Leu Tyr Leu Pro Ser Gln Asp Gly Arg Leu Val Lys
        3155                3160                3165
Ser Ser Ile Leu Val Phe Asp Asp Ala Pro His Tyr Lys Ser Arg Ile
        3170                3175                3180
Gln Gly Asn Ile Gly Val Gln Met Leu Val Asp Leu Ser Gln Cys Tyr
3185                3190                3195                3200
Leu Gly Lys Asp His Gly Phe His Thr Lys Leu Ile Met Leu Phe Pro
            3205                3210                3215
Gln Lys Leu Arg Pro Arg Leu Leu Ser Ile Leu Glu Glu Gln Leu
            3220                3225                3230
Asp Glu Glu Thr Pro Lys Val Cys Gln Phe Gly Ala Leu Cys Ser Leu
        3235                3240                3245
Gln Gly Arg Leu Gln Leu Leu Leu Ser Ser Glu Gln Phe Ile Thr Gly
3250                3255                3260
Leu Ile Arg Ile Met Lys His Glu Asn Asp Asn Ala Phe Leu Ala Asn
3265                3270                3275                3280
Glu Glu Lys Ala Ile Arg Leu Cys Lys Ala Leu Arg Glu Gly Leu Lys
            3285                3290                3295
Val Ser Cys Phe Glu Lys Leu Gln Thr Thr Leu Arg Val Lys Gly Phe
            3300                3305                3310
Asn Pro Ile Pro His Ser Arg Ser Glu Thr Phe Ala Phe Leu Lys Arg
        3315                3320                3325
Phe Gly Asn Ala Val Ile Leu Leu Tyr Ile Gln His Ser Asp Ser Lys
        3330                3335                3340
Asp Ile Asn Phe Leu Leu Ala Leu Ala Met Thr Leu Lys Ser Ala Thr
3345                3350                3355                3360
Asp Asn Leu Ile Ser Asp Thr Ser Tyr Leu Ile Ala Met Leu Gly Cys
            3365                3370                3375
Asn Asp Ile Tyr Arg Ile Gly Glu Lys Leu Asp Ser Leu Gly Val Lys
            3380                3385                3390
Tyr Asp Ser Ser Glu Pro Ser Lys Leu Glu Leu Pro Met Pro Gly Thr
        3395                3400                3405
Pro Ile Pro Ala Glu Ile His Tyr Thr Leu Leu Met Asp Pro Met Asn
        3410                3415                3420
Val Phe Tyr Pro Gly Glu Tyr Val Gly Tyr Leu Val Asp Ala Glu Gly
3425                3430                3435                3440
Gly Asp Ile Tyr Gly Ser Tyr Gln Pro Thr Tyr Thr Tyr Ala Ile Ile
            3445                3450                3455
```

```
Val Gln Glu Val Glu Arg Glu Asp Ala Asp Asn Ser Ser Phe Leu Gly
        3460                3465                3470
Lys Ile Tyr Gln Ile Asp Ile Gly Tyr Ser Glu Tyr Lys Ile Val Ser
        3475                3480                3485
Ser Leu Asp Leu Tyr Lys Phe Ser Arg Pro Glu Glu Ser Ser Gln Ser
        3490                3495                3500
Arg Asp Ser Ala Pro Ser Thr Pro Thr Ser Pro Thr Glu Phe Leu Thr
3505                3510                3515                3520
Pro Gly Leu Arg Ser Ile Pro Pro Leu Phe Ser Gly Arg Glu Ser His
                3525                3530                3535
Lys Thr Ser Ser Lys His Gln Ser Pro Lys Lys Leu Lys Val Asn Ser
        3540                3545                3550
Leu Pro Glu Ile Leu Lys Glu Val Thr Ser Val Val Glu Gln Ala Trp
        3555                3560                3565
Lys Leu Pro Glu Ser Glu Arg Lys Lys Ile Ile Arg Arg Leu Tyr Leu
        3570                3575                3580
Lys Trp His Pro Asp Lys Asn Pro Glu Asn His Asp Ile Ala Asn Glu
3585                3590                3595                3600
Val Phe Lys His Leu Gln Asn Glu Ile Asn Arg Leu Glu Lys Gln Ala
                3605                3610                3615
Phe Leu Asp Gln Asn Ala Asp Arg Ala Ser Arg Arg Thr Phe Ser Thr
                3620                3625                3630
Ser Ala Ser Arg Phe Gln Ser Asp Lys Tyr Ser Phe Gln Arg Phe Tyr
        3635                3640                3645
Thr Ser Trp Asn Gln Glu Ala Thr Ser His Lys Ser Glu Arg Gln Gln
        3650                3655                3660
Gln Asn Lys Glu Lys Cys Pro Pro Ser Ala Gly Gln Thr Tyr Ser Gln
3665                3670                3675                3680
Arg Phe Phe Val Pro Pro Thr Phe Lys Ser Val Gly Asn Pro Val Glu
                3685                3690                3695
Ala Arg Arg Trp Leu Arg Gln Ala Arg Ala Asn Phe Ser Ala Ala Arg
        3700                3705                3710
Asn Asp Leu His Lys Asn Ala Asn Glu Trp Val Cys Phe Lys Cys Tyr
        3715                3720                3725
Leu Ser Thr Lys Leu Ala Leu Ile Ala Ala Asp Tyr Ala Val Arg Gly
        3730                3735                3740
Lys Ser Asp Lys Asp Val Lys Pro Thr Ala Leu Ala Gln Lys Ile Glu
3745                3750                3755                3760
Glu Tyr Ser Gln Gln Leu Glu Gly Leu Thr Asn Asp Val His Thr Leu
                3765                3770                3775
Glu Ala Tyr Gly Val Asp Ser Leu Lys Thr Arg Tyr Pro Asp Leu Leu
        3780                3785                3790
Pro Phe Pro Gln Ile Pro Asn Asp Arg Phe Thr Ser Glu Val Ala Met
        3795                3800                3805
Arg Val Met Glu Cys Thr Ala Cys Ile Ile Ile Lys Leu Glu Asn Phe
        3810                3815                3820
Met Gln Gln Lys Val
3825
```

<210> 17
<211> 11
<212> DNA
<213> Homo sapiens

<400> 17
accccta ttc a   11

```
<210> 18
<211> 10
<212> DNA
<213> Homo sapiens

<400> 18
accccattca                                                    10

<210> 19
<211> 10
<212> DNA
<213> Homo sapiens

<400> 19
aaagcgacac                                                    10

<210> 20
<211> 10
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(10)
<223> n = A,T,C or G

<400> 20
aaagngacac                                                    10

<210> 21
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 21
ccttccagta ctgtgttatt tgtgag                                  26

<210> 22
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 22
caagaacttc ctcagggcat c                                       21

<210> 23
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer
```

```
<400> 23
gatgcatcta tacaacatcc gct                                              23

<210> 24
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 24
gggtgggaaa taggttcctt c                                                21

<210> 25
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 25
aaaaatgaga atccaaatgt gct                                              23

<210> 26
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 26
gcactaaggc taggttttgt gaag                                             24

<210> 27
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 27
gctcctcact tcctcttgtt g                                                21

<210> 28
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 28
cgtgaattgg cttcatgata a                                                21
```

<210> 29
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 29
agcaatcaga ttccagcaag c   21

<210> 30
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 30
gatgggaatg tcagtgatat gg   22

<210> 31
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 31
gggagaagtt gacaaagttg ga   22

<210> 32
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 32
ctttggttca tcactgggaa g   21

<210> 33
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 33
tccaaagcat tgaacacacc t   21

<210> 34
<211> 21
<212> DNA

<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 34
caggtcccgt aagacactca g   21

<210> 35
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 35
caatgggtgc tttgctgtta c   21

<210> 36
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 36
cgaagaactc ccgagaactc a   21

<210> 37
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 37
gctggctgca aacagatact ac   22

<210> 38
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 38
gcaaacatgg tttcaggctt a   21

<210> 39
<211> 22
<212> DNA
<213> Artificial Sequence

<220>

<223> oligonucleotide primers

<400> 39
caaacaatcc gcttccttcc at   22

<210> 40
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 40
attattcgtc ggcaaagctg a   21

<210> 41
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 41
ttccgcgaac tttttgaaac c   21

<210> 42
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 42
acacaaagtg ctggcccttg c   21

<210> 43
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 43
gatgcaaagg cgacagaaat c   21

<210> 44
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 44

atacagcaca tttagagctc cagt   24

<210> 45
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 45
gcatcagaca gaatggtcca g   21

<210> 46
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 46
gcaattcaac atatgcagga g   21

<210> 47
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 47
gtgaatggcc actttgcact   20

<210> 48
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 48
tgatatcagc aggggtcaca t   21

<210> 49
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 49
accacacgca aaacagtagc a   21

<210> 50

```
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 50
gccatgcatt cttaagccaa g                                        21

<210> 51
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 51
tgacatttcc agctttgctg a                                        21

<210> 52
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 52
agcggccact gatggattta t                                        21

<210> 53
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 53
aaatgatttt gaggcacttt tg                                       22

<210> 54
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 54
ttccacccag gatgtcataa a                                        21

<210> 55
<211> 24
<212> DNA
<213> Artificial Sequence
```

```
<220>
<223> oligonucleotide primers

<400> 55
acagtagact aaagcaagca aagc                          24

<210> 56
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 56
atcaagagga ggatccaggt t                             21

<210> 57
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 57
catcctgccc tattcttcca g                             21

<210> 58
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 58
taaagcgcaa ggtctcgtac a                             21

<210> 59
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 59
tgagggcaaa caattagatc c                             21

<210> 60
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers
```

```
<400> 60
tctgctgtgg ggaataggat t                                                    21

<210> 61
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 61
gcaaagccct aagagaagga tt                                                   22

<210> 62
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 62
tgctttgaga gctttcctca g                                                    21

<210> 63
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 63
tgaaagagaa gatgctgaca attc                                                 24

<210> 64
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 64
gtaagtctgt ccggctgaag g                                                    21

<210> 65
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 65
catcccgatt tcagtcagac a                                                    21
```

<210> 66
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 66
ttcgtgctac aacacattca aga   23

<210> 67
<211> 129
<212> PRT
<213> Homo sapiens

<400> 67
```
Gly Gln Arg Glu Pro Leu Thr Val Arg Ile Lys Asn Ile Leu Glu Glu
1               5                   10                  15
Tyr Pro Ser Val Ser Asp Ile Phe Lys Glu Ile Leu Gln Asn Ala Asp
            20                  25                  30
Asp Ala Asn Ala Thr Glu Cys Ser Phe Leu Ile Asp Met Arg Arg Asn
        35                  40                  45
Met Asp Ile Arg Glu Asn Leu Leu Asp Pro Gly Met Ala Ala Cys His
    50                  55                  60
Gly Pro Ala Leu Trp Ser Phe Asn Asn Ser Gln Phe Ser Asp Ser Asp
65                  70                  75                  80
Phe Val Asn Ile Thr Arg Leu Gly Glu Ser Leu Lys Arg Gly Glu Val
                85                  90                  95
Asp Lys Val Gly Lys Phe Gly Leu Gly Phe Asn Ser Val Tyr His Ile
            100                 105                 110
Thr Asp Ile Pro Ile Ile Met Ser Arg Glu Phe Met Ile Met Phe Asp
            115                 120                 125
Pro
```

<210> 68

<400> 68
  000

<210> 69

<400> 69
  000

<210> 70

<400> 70
  000

<210> 71

<400> 71
  000

<210> 72

<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 72
tcattcatat gtcccaggga catgt   25

<210> 73
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primers

<400> 73
acccctattc a   11